

## **Historic, Archive Document**

Do not assume content reflects current scientific knowledge, policies, or practices.



# Cleanings in Bee Culture

VOL. XXXIX

JANUARY 1, 1911

NO. 1

Editorial

Stray Straws

Bee-keeping in Southern California

Bee-keeping Among the Rockies

Notes from Canada

Conversations with Doodittle

English Methods of Wintering

Natural Selection and Diseases of Bees

Selling Honey at Home

Sour and Sweet Honey Mixed Together

Migratory Bee-keeping in Holland

Extracting as soon as Honey is Removed from Hives

Wasp's Nest in Section of Honey

How Shapes of Honey-bottles Affect Sales

Winter Nest of a Colony

Bee-keeping as a Hobby

Bee-keeping in California

A Case of Propolis Poisoning

D. M. MACDONALD

G. W. BULLAMORE

C. W. PHELPS

STEPHEN ANTHONY

HANS MATTHES

GEO. SHIBER

S. N. HATHAWAY

WESLEY FOSTER

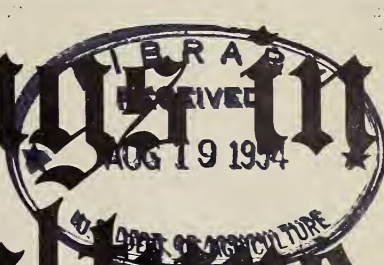
E. R. ROOT

F. DUNDA'S TODD

P. C. CHADWICK

C. H. HOWARD

Heads of Grain Our Homes



# Buy Land on the Burlington

## in the Big Horn Basin, Wyoming

The census figures tell the story. Population now more than 15,000 people against 4,000 at last census. No other part of Wyoming has grown so fast, and this gain practically in the last five years.

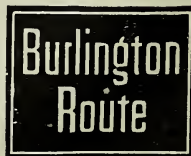
## Make Money on Land

Five years ago these lands were selling at from \$15.00 to \$20.00 per acre. The same lands with improvements are now selling as high as \$60.00 to \$80.00 per acre. You can homestead just as good lands today, just as close to the railroad or buy just as good raw lands at \$45.00 to \$50.00 and make as much money as those who invested then.

**GET IN ON THE GROUND FLOOR** before the completion of the new line, where you can locate a good alfalfa farm close to new growing towns that will help to make your land valuable. Here is a great combination of natural resources and rich farm land, with an abundant supply of water for irrigation, that you cannot afford to overlook.

**UP-TO-DATE LITERATURE FREE.** Write today for our literature with maps, telling all about these lands, homeseekers' rates, personally conducted excursions, and other valuable information.

D. Clem Deaver, Gen'l Agt.  
Landseekers' Information Bureau  
1004 Farnam Street  
Omaha, Neb.



6387

**D. Clem Deaver, 242 Q Bldg., Omaha, Neb.**  
Please send me special Wyoming literature.  
Name.....  
Street No. or  
Rural Route.....  
Town.....  
State.....



# Index to Gleanings in Bee Culture

## Volume XXXIX

In using this index the reader should not fail to note that it is divided into five departments, namely, General Correspondence, Editorials, A. I. Root's Writings, Contributors, and Illustrations. The index of General Correspondence includes every thing except editorials and A. I. Root's writings.

### GENERAL CORRESPONDENCE.

Absconding swarm, how far will it fly 558; Absconding swarms, to catch 265; Absconding, to prevent, in California 471; Absorbents must be above sealed covers 32; Absorbing cushions preferred in England 3; Adulteration, state laws against 4; Advertising, Brockmire on 490; Advertising, Dan White on 684; Advertising, Greiner on 170; Advertising in local papers 199, 278; Advertising, National 146, 160; Advertising, Poudon on 225; After-swarms for increase, Doolittle on 359; After-swarms, to prevent 5, 237, 354; After-swarm when there had been no prime swarm 666; Air, purity of, necessary for cellar 4; Alexander plan not for all localities 150; Alfalfa, number of colonies given territory will support 733, 746; Alfalfa, do bees injure 636; Alfalfa for grazing instead of hay 126; Alfalfa in New Mexico 257, 407; Alfalfa in Texas 52; Alfalfa in unirrigated regions 713; Alfalfa yielding in Missouri 552; Alfalfa yields no honey in Illinois 418; Alley queens non-swarmers 228; Alsike not a drought resister 713; Amateur's first year 305; American foul brood, see "Foul brood"; Anatomy, modern students of 758; Anatomy of the bee 166; Ants a nuisance to bee-keeper 634; Ants, to keep away from bees 322, 357, 418, 484, 646, 667, 733; Apiary, arrangement of, Townsend on 181; Apiary, hexagonal plan for 4; Apiary, next to wheat field 149; Apiculture short course at Ontario Agri. College 356, 435; Apiculture taught in colleges 356; Apples, why shipped in barrels 680; Apple tree, bees from trunk of 747; Arizona, bee-keeping in Salt River Valley 698; Artificial selection, effect on bees 269; Astors, wild 50; Australasian bee manual 716; Automobile accident serious 667; Automobile, Reo runabout for an apiary 151; Automobile trailer 501.

Bait-sections, Dr. Miller on 60; Bait-sections, proper arrangement of 38; Bait-sections, to get rid of dark honey in 185; Balling, breeding to eliminate 460; Balling of queens serried in the tropics 654; Banats resemble blacks, 32; Barrels of honey in Florida 751; Basswood honey,—is it ever dark in color 614; Beautifying the apiary, Praval on 139; Bee behavior, A. C. Miller on 663; Bee-demonstrations at street fair 80; Bee-escapes not practical when no excluders are used 300; Bee inspection, see inspection; Bee-keepers' Gazette, first number of 88; Bee-keepers, 900 in Los Angeles Co., 681; Bee-keepers cannot be united 237; Bee-keeping as a hobby 21, 109, 177, 222; Bee-keeping for beginners, illustrated 43, 72, 102, 181, 216, 245, 300, 336, 395; Bee-keeping for women, Comstock on 423; Bee-keeping in Colorado, questions about 536; Bee-keeping in Florida, introduction 129; Bee-keeping in highlands of Mexico 50, 75, 103, 142, 172; Bee-keeping on an island naval station 105; Bee-louse 468; Bee-martins 377; Bee paralysis destructive in France 418; Bees and poultry, Scholl on 294; Bees as fertilizers of fruit blossoms 163; Bees, better quality vs. larger quantity 550; Bees carried cut because crippled by moth-worms 686; Bees desert hive full of honey 164; Bees, different work for different ages 678; Bees, do they rest between trips to field 720; Bees drunk on cider 228; Bees dying for lack of air 113; Bees dying with plenty of honey in combs 232; Bees essential in an orchard 139; Bees excited by bee-sting poison 557; Bees, how changed by artificial selection 269; Bees, how long do they live 519; Bees, how many can farmer care for 553; Bees, how much do they carry at a load 32; Bees in California away from railroads 61; Bees killing brood 571; Bees,

length of time required to make a trip 734; Bees,—neighborhood alarmed without cause 629; Bees, number in quart 151; Bees, size of in old combs 256; Bees, size of to increase 161, 237, 263, 354; Bees transfer larvae 111; Bees, unhappy experience with 766; Bees, variation in, when introducing 524; Beeswax explosion, cause of 504; Beeswax, purity tests for 488, 520; Beet sugar as good as cane 227; Beet sugar, Dr. Miller on 33; Beet sugar, Foster on 126; Bee-veil, poem 200; Beginner, good outfit for 281; Belgium, bee-keeping in 717; Bigelow's article in Technical World 748; Bitter honey in Mexico 77; Black brood, see "Foul brood"; Black chickens stung, white ones escape 150; Black color irritates bees 70, 150, 239; Black sage yielded in California 387; Blacks gather more honey-dew than Italians 556; Blossom-spraying, bad policy 139; Blueberry honey 223; Bookkeeping and bee-keeping 202; Books for beginners, Doolittle on 36, 162; Borrowing bees 115; Bottling, does it pay a bee-keeper 563, 746; Bottom-board similar to J. E. Hand's 116; Bottom starters, Dr. Miller's instructions for using 322; Box hives prohibited in New Zealand 96; Breakage in shipping comb honey 355; Breaking of sections, to guard against 202; Breathing of bees 186; Breeder and buyer, trouble between 205, 439; Breeder of queens, opening for in Canada 453; Breeding, drones indirectly selected for 4; Breeding in spring, what controls it 196; Breeding, to develop certain characteristics 651; Breeding to eliminate balling tendencies 460; Breeding to prevent swarming 590; British apiary, model 499; Brood-combs, difference in weight of when empty 60; Brood thrown out at entrance 603; Brown sugar not profitable to feed 745; Brushing bees from comb, Metcalfe's plan 367; Buckwheat, Crane on 745; Buckwheat,—does it yield only in the morning 602, 713; Buckwheat honey, amount in Canada 518, 533; Buckwheat, how late may it be sown for honey 151; Buckwheat sown more extensively 16; Buckwheat sown with corn 667; Buckwheat, to grow, profitably 503; Buckwheat, which kind to sow 602; Buckwheat, will bees fly 2½ miles to 441; Bulk comb honey and swarm control 251; Bulk comb honey, granulation of 163, 298, 419; Bulk comb honey profitable in the North 551, 746; Bulk comb honey, real price of 35; Bulk comb honey sold more easily than comb honey 253; Bulk comb honey supers, to keep pollen out of 734; Bumblebees not subdued by smoke 187; Burlap mats replace covers in cellar 700; Busv Bee, poem 441.

Cage, new ore for mailing queen 554; Cage, Sladens' press-in-comb 761; Caging of queen in brood chamber, will cells be started 732; California and Minnesota compared 69; California bee-keeping, Chadwick on 23; California, bee locations in 275; California, condition of bees in 265, 358, 387; California, conditions in unfavorable for a crop 370; California, county ordinance for foul brood in 255; California convention report 220; California, foul brood inspectors in 469; California, good locations in scarce 186; California honey crop, 50 lbs. per colony 552; California, honey-plants of, bulletin 651; California law all right 700; California needs new disease law 552; California, prevention of spring dwindling 470; California, prices of honey in 358; California sage, 526; California, summary of last season in 589; California, will more bees lessen colony average 274; Can, 60-lb., how much honey in 26; Canada, bees wintered well in 325; Canada, season in, late 325; Candied

honey found in hive 605; Carried honey, to dispose of 162; Candy, hard, for cold-weather feeding 766; Candying of honey hastened by stirring 680; Cans, second-hand 37; Capping-melter advocated 473; Capping-melter home-made 403; Capping-melter, Lathrop's 732; Capping-melter, Severin's 722; Capping-melters, why some are not satisfactory 489; Capping-melter vs. large uncapping box 216; Cappings drain better in a cellar 386; Cappings, separating honey from without capping-melter 365; Carbolic acid for driving bees from supers 26; Carbolic acid for finding queens 720; Carbolic acid for transferring 717; Carbolic acid in spraying solutions has no effect 221; Carbolic acid to prevent robbing 419, 516, 572, 615; Carbolic acid, Yates on 716; Carbolic cloths, Crane on 89; Carbolic cloths do not taint honey 263; Carbolic cloths, Gray on 251; Carbolic cloths, how much used now 33; Carbolic cloths, more directions for 256; Carbolic cloths satisfactory 228, 635; Carbolic cloths vs. smokers 744; Carbolineum to drive away ants 733; Carniolan queens arrive dead 197; Carniolans resist foul brood 266; Carniolans vs. Italians 203; Carrying cases in the apiary 690; Carrying hives, Byer's method 125; Cartons, advantages of 551; Cartons for comb honey on the increase 239; Cartons, increasing demand for comb honey in 68; Cat eats bees 618; Caucasian, another who prefers 473; Caucasian bees and their crosses 455; Cellar, bees in during warm weather 196; Cellar, burlap mats used instead of covers 700; Cellar, damp, how to remedy 310; Cellar, Holtermann's, why not used 89, 694; Cellar, House's ideal 209; Cellar, record of loss of weight in 588; Cellars, concrete ideal material for 562; Cellar, screens in cause trouble 25; Cellar, setting bees from early or late 128; Cellars, temperature of 26, 169; Cellar, ventilation of 227, 237; Cellar, what is normal loss of bees in 115; Cellar-wintering, Townsend on 43; Cell-building, borrowing bees for 256; Cell-building, feeding necessary for 60; Cells, are they started after super work begins 550; Cells built the other side of zinc 52; Cells in super, will they incite swarming? 604, 646; Cells, will they be started if queen is caged in brood-chamber 732; Chaff hives, old style two-story 271; Chaff hives with tight bottoms, difficulties with 113; Cheesecloth, roll of used as strainer 15; Cherries over-ripe, bees work on 342; Chickens a nuisance 486; Chickens do not eat bees if rations well balanced 571; Chimney, removing bees from 473; Cider mills, to keep bees away from 572; Cigar-box, bees dying in 52; Climate of Gt. Britain and United States compared 112; Clothing in the tropics 719; Clover crop light 680; Clover-honey too thick to extract 256; Clover killed in Canada 518; Clover, prospect for 1912 713; Clover, red, worked by red clover bees 149; Clustering out, the reason for 535; Cocoons, do the bees tear them from cells? 88; Cocoons, to separate from old combs 52; Colleges with courses in apiculture 356, 435; Colonies that did not swarm great honey-gatherers 32; Colony, average yield for 678; Colorado and eastern markets 714; Colorado convention 126, 714; Colorado crop prospects 264; Colorado foul brood law secured 388; Colorado, questions about bee-keeping in 536; Color, bees hostile to black 70, 150, 239; Color of bees, meaning of terms 205; Colors of pollen 341; Comb and extracted honey produced at the same time 51; Comb building haphazard job 664; Comb, drawn, value of 699; Comb honey discolored by old combs in brood-nest 297; Comb honey, increasing demand for in cartons 68; Comb honey in glass 602; Comb honey, lack of uniform grades 456; Comb honey, large number of unfinished sections 26; Comb honey produced without separator 243; Comb honey production in the South, Wilder on 201; Comb honey production on the wane 5; Comb honey production without swarming 403; Comb honey profits compared with those from extracted and bulk comb 617; Comb honey, proper temperature for 680; Comb honey, S. D. House's plan for producing 368; Comb honey, should it be filled out close to the wood 354; Comb honey that does not candy 32; Comb honey, the best way

to keep it 454, 487; Comb honey used more than extracted in Colorado; Comb honey wrapped in transparent paper 559; Comb interferes with introduction of queen 311; Comb leaned against hive emptied by bees 583; Combs built out of doors 310; Combs, difference in weight of when empty 60, 699; Combs, empty, to take care of 165; Combs honey-bound and no eggs 473; Combs, can they get too old 60, 88, 293; Combs, mouldy, should they be rendered into wax 358; Combs, returning to hives when empty 335; Community hives 69; Concrete bee-cellars 562; Condensation of moisture in winter 149; Cooking, honey used freely in 765; Co-operation in selling honey 204, 376; Co-operation, is it possible among bee-keepers 264, 164; Co-operation, Mrs. Acklin on 164; Co-operative honey producers' association in Idaho 388; Copper vessel for making syrup 537; Cork-dust not suitable for packing 678; Cotton honey not described correctly 408; Cotton in smoker irritates bees 664; Cotton sprayed with paris green 537; Cottonwood as a source of propolis 106; Cover, metal-roofed air-spaced 619; Covers in cellars replaced by burlap mats 700; Cranberry blossoms fertilized by bees 34; Creoline to stop robbers 719; Creosote as a substitute for paint 764; Crickets and moths in Arizona 698; Cross bees as honey-gatherers 720; Cross bees, how to kill 581; Crushing bees, does it anger colony 418; Cuba, bee-keeping in 718; Cucumber not important for honey 354; Cupid Stung, poem 265; Cyprians, characteristics of 601; Dampening sections by placing them in cellar before folding 186, 237; Dampness of hives inside 25; Dandelions in October 646; Dandelions on the increase 355; Dandelion yielding better than fruit bloom 354; Danzenbaker hive, changes suggested 438; Danzenbaker hive, making sure of winter stores in 631; Deaths from bee-stings rare 186; Decapitating brood to prevent swarms 721; Demonstrating by a little girl 754; Diagnosing a colony by outside conditions 326, 422; Digested food, bees fond of 664; Diseases, see "Foul brood"; Dividing in spring, double board for 310; Divisible brood chamber hives, 52, 238, 401; Division-board, see follower; Double-tier shipping-case, see shipping-case; Drone-comb built when bees reconstruct old cells 293, 355, 485, 516, 680; Drone hatched from queen cell 744; Drone killing an indication of drouth 505; Drones allowed in any hive 519; Drones, are there more of them in foul brood colonies 386; Drones, early, to secure 267; Drones, indirect selection of 4; Drones, what becomes of them in alley trap 409; Drones with red eyes 599; Drouth in Texas 421; Drowning bees, difficulty in 186; Dummy in 10-frame hive 60; Duty on honey 124; Dysentery in cellar 116.

Eastern New York convention 48; Eggs and brood, proportion of from normal queen 418; Eggs, average capacity of good queen 744; Eggs, do bees move 516, 648, 732; Eggs missing, combs honey-bound 473; Eggs, more than one in a cell 536; Eggs of queen vary in size 388; Eggs sent by mail 634; Eggs that do not hatch, 383, 418, 452, 516, 616, 660, 734; England, garden-bee-keeping in 281; English methods of wintering 9; Entrances, how to screen for shipping bees 371; Entrances, size of depends on locality 4; Entrance, size of for winter 51. 91; Entrances, size of in cellar 4; Entrance ventilation during winter 433; European foul brood, see "Foul brood"; Europe, bee-notes from 758; Evaporating honey, how the bees do it 472; Excluder, only three oppose use of 648; Excluders, are they made too light 484; Excluders, Doolittle on 715; Excluders not used by Dr. Miller 88; Excluders not used by Scholl 682; Excluders under super 537; Excluder, will cells over induce swarming? 604; Excrement of bees solid 664; Exhibiting at fairs, E. G. Hand on 298; Exhibit, State Association to renew 5; Express companies in Canada, to make new rate 63; Extracted, good enough term 33; Extracted honey, reason why public does not know about 298; Extracting as soon as combs are removed from hive 15; Extracting-combs, allowing bees to clean out 552; Extracting-combs, large stock of necessary 60; Extracting-combs, to keep free from moths 5; Ex-



tracting during the honey-flow, Greiner on 133; Extracting-houses, Townsend's portable 137; Extracting light honey before the dark comes 518; Extracting-outfit, Ensley's portable 661; Extracting-outfit, Severin's ideal, 690; Extracting part of a super at a time 133, 268; Extracting with electric motor 40; Extractor coated with wax to prevent rust 484; Extractor-cover, substantial 608; Extractor, inventor of 60; Extractors, loading and unloading 302.

Fair, bee demonstrations at 80; Fairs and expositions 452; Farmers institutes for beekeepers 198; Fastening foundation with melted wax, Aikin on 373; Fastening foundation with pyrographic outfit 766; Feeder made from glass tumbler 516; Feeders, percolator not liked 34; Feeders, percolator, on small scale 88, 239, 263; Feeding advisable even if sugar is expensive 682; Feeding back to produce comb honey 603; Feeding by pouring syrup into bottom boards 311; Feeding, does it pay between fruit-bloom and clover? 32; Feeding for January honey-flow 26; Feeding for winter 503; Feeding in cold-weather, hard candy for 766; Feeding in spring should be discouraged 33; Feeding in spring should not be discouraged 341; Feeding in spring successful 258; Feeding in winter in Tennessee 26; Feeding molasses and sugar in North Carolina 185; Feeding outdoors, Crane on 680; Feeding outdoors feeds all bees in locality 616, 717; Feeding outdoors, how much surface needed per colony 581; Feeding slowly from a Mason jar 635; Feeding syrup made of 4 parts water to one of sugar 550; Feeding syrup to make bees stay where placed 581; Fires, to prevent in the apiary 35; Flight of bees, length of 441, 602, 748; Florida, bee-keeping in, E. R. Root on 751; Florida, bee-keeping in Southern 504; Florida, difficulties in 243, 279, 308; Florida, drouth in 311; Florida, migratory bee-keeping in 334; Florida, representative bee-men in 363, 398, 426, 461, 493, 525; Florida, surplus honey sources in 174, 213; Flour method of introduction 228; Flowers and humanity, Lovell on 750; Flying backwards, is it possible 734; Fly-trap, bees in 647; Follower in 10-frame hive 60; Follower needed even if combs are not self-spacing 125; Followers shorter than the hive 32; Foot-power saw, Crane on 745; Forest fires destroy bee pasturage 552; Formic acid in honey 322, 418; Foster, Oliver, how related to Wesley 6; Foul brood, Alexander plan for 52, 60; Foul brood, American, fall treatment for 584; Foul brood, American, near Marengo 484; Foul brood and natural selection 10; Foul brood, are American and European the same? 765; Foul brood at Dr. Miller's 619, 679; Foul brood bill before Colorado legislature 226; Foul brood, British Bee Journal on examination for 7; Foul brood, can it be carried by foundation 732; Foul brood continues in spite of laws 744; Foul brood, county ordinance in California 255; Foul brood, does it affect the laying of a queen? 386; Foul brood, European, Cavanagh on 77, 107, 130, 375; Foul brood, European, cured and honey produced 227; Foul brood, European, has odor 518; Foul brood, European, in California 616, 681; Foul brood, European, in Southern California 491; Foul brood, European, in Western Vermont 451; Foul brood, European, Italianizing for 679; Foul brood, European, S. D. House on 330; Foul brood, European, Warrington Scott on 656; Foul brood, European, Selwyn on 254; Foul brood, European, to keep bees free from 183; Foul brood, European, who is responsible 471; Foul brood, external characteristics of 404; Foul brood, Foster's fall treatment for 745; Foul brood increasing in N. Y. 170; Foul brood in Florida 309; Foul brood inspection in Canada 453; Foul brood inspector, everyone his own 600, 615; Foul brood inspector, relation of bee-keeper to 517; Foul brood inspectors in California 469; Foul brood, Italian vs. black for immunity from 571; Foul brood, Italians vs. hybrids 354; Foul brood law for British Columbia 208; Foul brood law, how it may be ineffective 535; Foul brood law in B. C. 453; Foul brood law in California 700; Foul brood law in Colorado, not passed 323; Foul brood law in Vermont 34; Foul brood law, new, Colorado 517; Foul brood law, new one needed in Cali-

forria 552; Foul brood law passed in Illinois 354; Foul brood law, Pennsylvania 567; Foul brood law secured in Colorado 388; Foul brood legislation in Indiana, prime movers of 728; Foul brood, names of, Dr. Miller on 160; Foul brood need not be epidemic 718; Foul brood report from Indiana 196; foul brood samples, danger in sending in loose packages 682; Foul brood, Selwyn's plan for curing 254, 375; Foul brood treatment, carbolic acid in 717; Foul brood, two extremes in treating 504; Foul brood, what is origin of 329; Foul-broody apiaries, importance of reinspection 714; Foul-broody combs, should they be placed over clean hives 254, 356; Foundation, can it carry disease 635, 732; Foundation-cutter, Smith's adjustable 144; Foundation, do bees draw it out 343; Foundation fastened with melted wax, Aikin on 373; Foundation fastened with pyrographic outfit 766; Foundation fastener, Byard's 293; Foundation, full sheets used by F. Greiner 322; Foundation, full sheets vs. starters 46; Foundation, how it should be hung 282; Foundation in sections, value of 162; Foundation, melted wax plan for 213; Foundation, old vs. fresh 200, 266; Foundation supported by wire or splints 322, 529; Foundation under brood-chamber to prevent swarming 258, 322; Frame-nailing block, Scholl's 90; Frame, reversible 730; Frames, closed-end, in Simplex hive 667; Frames, device for spacing loose-hanging 699; Frames, nine in eight-frame hives 700; Frame-spacer made of stamped button 228; Frames smaller than Langstroth 115; Frames, staple-spaced vs. Hoffman 25; Freight rates on honey, will they advance? 89; Frost in May in California 387; Fruit blossoms, bees to fertilize 163; Fruit, proof that bees do not puncture 537; Fruit scarce, good demand for honey 453; Fumigating with sulphur, danger of using too much 572.

Gable covers, how to make them 282; Gerlessness of bees in California 5; Georgia, honey in 700; Glucose, can it be fed to stimulate 502; Glucose in shoe leather 196; Gnats, do they harm bees 732; Golden-rod as honey-plant 666; Golden-rod honey, odor of 628; Grades of comb honey, lack of uniformity 456; Grading and packing, reform in 342; Grading of comb honey, S. D. House on 533; Grading-rules, national, plea for 714; Grafted cells, why the bees would not accept 376; Grafting and cell-building, information wanted 25; Grafting from larvae not over thirty-six hours old 749; Grafting tool made of filed pin 585; Granulated honey fed at entrance 150; Granulated honey fine-grained if stirred 550; Grasshoppers, united efforts to fight 6; Grass kept down by hogs 125; Gravity-strainer abandoned 15; Gravity-strainer, capacity of 409; Gravity-strainer endorsed 34, 39, 186; Gravity-strainer, Metcalfe's objection to 534, 680; Gravity-strainers not adapted for thick honey 334; Gravity-strainer, Powell's 327, 487; Gravity-strainer, Townsend 245; Grocer, educating, Foster on 592.

Hand switch bottom-board 603; Hand system, when colonies are strong May 1 79; Hand's system needs no special bottom-board 207; Hauling loads of honey with rope 682; Hemet Valley Bee-keepers' Association 411; Herlong, R. W., life of 763; Hexagonal plan for apiary not advisable 163; Hive, Aspinwall 394; Hive, Danzenbaker, changes suggested 438; Hive lumber, heart side out 256; Hives, converting eight-frame to ten-frame 342; Hives damp inside 25; Hives, eight-frame, nine combs in 700; Hives, eight vs. ten-frame, 72, 89, 99, 165, 355, 390, 451, 586, 634, 681, 683; Hives in pairs 354; Hives, Langstroth vs. Jumbo depth 765; Hives, raised from ground more convenient 63, 275, 322; Hives, standard, Hopkins on 168; Hives, ten-frame, width of 256; Holland, migratory bee-keeping in 14; Holtermann, pictures of 7; Holtermann to cease writing 7; Homesteading and bee-keeping in Colorado 584; Homestead lands in Idaho scarce 240, 523; Honey above brood in brood-frames 322, 354; honey all disposed of in Texas 682; Honey, amount carried at one load 160, 162; Honey, amount carried into hive in season 744; Honey and wax, amount produced in U. S. 377; Honey a remedy for nervous exhaustion 615; Honey boards left on all sum-

mer 263; Honey-bottles, Foster on 17; Honey-butter, what is it 295, 302; Honey candled while still in hive 603; Honey clarified to remove pollen 323; Honey clogged-combs, to remedy 551; Honey, comb and extracted compared 197, 240; Honey, comparative prices of 196; Honey crop in Colorado 584; Honey-dew, in Ohio 443; Honey-dew, Italians gather less of 32, 556; Honey-dew marketed by Dr. Miller 712; Honey eaten by Mrs. Wilson at every meal 659; Honey harvest, how strength of colony affects 550; Honey-house, two-story 608; Honey, how much consumed by a colony in a year 537, 581; Honey, how much in 60-lb. can 26; Honey, how the bees place in cells 664; Honey not mentioned in magazine menus 293; Honey-plants of California, bulletin 681; Honey-plants of Florida, Baldwin on 174, 213; Honey production on large scale 267; Honey recipe book 198; Honey recipes, Scholl on 161; Honey report, extraordinary, in Canada 325; Honey rich in lime when dark 484; Honey-sac of bees 760; Honey salesman, requirements of 523; Honey sources, writers should tell time of 186; Honey, soured, is it safe to feed 653; Honey unsealed shifted in cells 664; Honey vs. other sweets 747; Honey, weight of a jelly-tumbler of 409; Honey, why Latham's does not granulate 163; Honey, why not all capped? 26; Horses stung to death 409; House-apary, manipulating bees in 187; Hutchinson, Farewell to, poem 485; Hutchinson, W. Z., death of 389; Hutchinson, W. Z., life of 391, 392, 393.

Idaho for bees 184; Idaho has co-operative association 388; Idaho, homestead land in 240, 408, 523, 588; Inbreeding, Tennent on 601; Increase, Alexander method 440; Increase, making for April now in Texas 185; Increase prevented by shaken swarm plan 377; Increase, rapid in Cuba 718; Increase, to keep down 219; Increase, Van Horn plan for 257; Inspecting for foul brood in cold weather 266, 199; Inspection work in Canada 453; Inspection in winter 199; Inspector, every one his own 600, 615; Inspector, relation of bee-keeper to 317; Inspectors of California, experience with 469; Instinct always the same 148, 293; Intensive Farming, poem 683; Introducing before bees know they are queenless 524; Introducing, beginners' trouble in 328; Introducing by giving new queen odor of old one 700; Introducing, press-in-comb method 761; Introducing queens and strengthening nuclei 51; Introducing to colony with no old bees 550; Introduction easier if queen is old 646; Introduction not so easy if bees are on combs 311; Iowa bee-keepers to organize 700; Irrigated land, bee-keeping in 272; Isle of Wight bee disease 389; Italianizing to get rid of European foul brood 679; Italians, are there any two-banded 763; Italians, leather-colored vs. black bees 600; Italians the worst robbers 535; Italians vs. blacks 100, 667, 730; Italians vs. blacks for immunity from foul brood 571; Italian vs. Carniolans 203; Jamaica, bee-keeping in 463; Jamaica, bee-keeping in, some corrections 633; Jones, D. A., in memoir of 93, 125.

Keeping more bees 747; Kerosene tainted sugar, can it be used 116, 635; King-birds do mischief in queen rearing yards 505; Knife, advantage of having curved blade 583; Knife, for uncapping with a wide bevel 421; Knife, steam, objection to 451; Knife, steam, tried and abandoned 572; Knives, Bingham and Jones compared 360.

Labels for comb honey, Crane on 163; Labor Troubles, poem 474; Larvae moved by bees 377; Larvae transferred by bees 111; Lath and shingles for shade-boards 724; Law in British Columbia strict 615; Law in California all right 700; Laying workers, characteristics of, Miller on 88; Laying workers gotten rid of by brushing bees on ground 504; Laying workers, two cases of 114; Loading and unloading power extractors 302; Library of books on bees 294; Lime for purifying air in cellars 40; Lime in cellar will not dry the air 110; Liquefying, Pouders method 149; Liquid dropped by bees, is it water or nectar 746; Locust yielding honey in California 387; Long-idea hive, swarming easily prevented in 187; Long-idea hive, further particulars 184; Los Angeles Beekeepers' Club 198; Louisiana, bee-keeping in sugar cane region 112.

Mailing cage, new 554, 761; Mail-order houses, Dr. Miller on 450; Maple not safe guide for removing bees from cellar 263; Maple sugar increases demand for honey 293; Mason jar, leakage from 62; Massachusetts convention 504; Massachusetts Society of Bee-keepers 593; Mediterranean flour moth 566; Mesquite of Texas, economic value of 530; Metcalfe, O. B., biography of 49; Mice to clean up combs 451; Migratory bee-keeping 504; Migratory bee-keeping, Ahlers' 196; Migratory bee-keeping, Byer on 325; Migratory bee-keeping in California 623; Migratory bee-keeping in Florida 334; Migratory bee-keeping in Holland 14; Migratory bee-keeping, Matthews on 206; Milkweed pollen kills bees 572; Minnesota and California compared 61; Minnesota State meeting 80; Missouri, alfalfa yielding in 552; Models of bees 759; Moistening sections by placing them in cellar 237; Mormon mating-hive 495; Motherwort a good honey-plant 40; Moths and crickets in Arizona 698; Moths destroy combs not on hives 700, 746, 582, 646; Moths, to keep away from extracting-combs 5; Moths, trouble with 699; Moths will not develop if combs are frozen 734; Moth-worms cripple young bees 686; Mountains, will bees cross for honey 114; Moving apiarian laboratory 42; Moving bees short distances 96, 357, 439, 718; Moving bees, how to screen the entrances 371; Moving in cold weather 113; Moving 100 colonies 1,200 miles 437; Moving possible any time if syrup is fed 581; Muscles of honey bees 687.

Nailing frames, holder for 90; Nailing hive, right and wrong way 763; nailing supers, right and wrong way for 90; National convention wanted in California 616; National convention program 375; National grading-rules, plea for 714; National selling organization, objections to 299; Natural selection and diseases of bees 10; Nectaries of flowers, do thrips destroy 647; nectarless flowers 98; Neighbors, should a bee-keeper help 7; Netting, bees fly through 622; New Mexico, alfalfa in 257; New Mexico, bee-keeping in 45; New Mexico, better to investigate before investing 407; New Mexico, drawbacks to 224; New Mexico, shed apiary in 278; New Zealand, apiculture advancing in 491; New Zealand, bee-keeping in 467; New Zealand prohibits box hives 96; Non-swarmer already possible 218; Non-swarmer bees, what is advantage of 208; Non-swarmer bees, why are they wanted 208, 263; Non-swarmer bees a reality 67; Non-swarmer hive, Aspinwall 394; Non-swarmer, what is meant by 163; Nuclei, care of 601; Nuclei formed with virgin queen 440; Nuclei, forming by Summerford plan 602; Nuclei, uniting when two in hive 33; Nucleus hive for queen breeders 371; Nucleus, 200 lbs. of honey from three-frame 655; Nucleus wintered indoors 62; Oatmeal cookies, recipe for 199; Observatory hive, circular 729; Observatory hives, how long may bees be confined in 472; Observatory hives, renewing bees and queen in 572; Observatory hive, to attract attention of customers 60; Odor from golden-rod and aster honey 116; Odor of mashed bees, does it excite bees 646; Odor theory, overworked 614; Ohio convention, report on 253; Oklahoma bee-keepers organize 338; Old combs, do bees tear down and rebuild 160; Old combs, is it necessary to discard 60; Ontario Association, meeting of 649; Ontario convention 713; Orange, cool weather while in bloom 324; Orange honey, caution concerning 198; Orange yielded little in California 387; Outdoor sleeping porches 219; Ovary of queen-bee 72; Overstocking, Foster on 323; Overstocking in California 61; Overstocking in Idaho 96.

Packing materials, relative value of 25; Paint, creosote oil as a substitute for 764; Paint for bee-hives 185; Painting queens to mark them 712; Paint, kind of to use depends on locality 248; Paper shipping cases, see shipping cases; Paper, transparent for comb honey 559; Parcels post for selling honey 196; Parcels post, Metcalfe on 407; Parcels post, sending honey by 237; Paste for tin 590, 698; Pasturage, artificial, does-it pay to plant 454; Pecos Valley bee-keepers convene 45; Peddling honey, opportunities in 48; Pedigreed stock in Switzerland 450; Pennsylvania convention 566; Perculator feeders, 34, 88, 239, 263; Photography for



bee-keepers 722; Plurality of bees not practicable 115; Poison, bees do not seal in combs 731; Poisoning by propolis, history of case 24; Poison of sting, does it excite bees 7, 557, 646; Pollen above shallow frames 551; Pollen, artificial, what kind is best 151; Pollen candy 601; Pollen, can it be removed from honey 323; Pollen, colors of 341; Pollen from milk-weed kills bees 572; Pollen, how bees pack in cells 664; Pollen, how long does it take bee to get load 32; Pollen, how much needed 149; Pollen in sections over shallow brood chamber 551, 581; Pollen, to keep out of bulk comb honey supers 734; Pollen, too much of in brood-combs, 295; Pollen, to remove from combs 263; Porter, E. C., in memoriam of 630; Portugal furnishes bees for Missouri 263; Post offices named after the bee 322; Poultry, does it pay with bees 486; Poultry netting, bees do not fly through 516; Poultry-netting over hive to keep chickens away 558; Poultry, Scholl on 294; Power extractor, pump attached to 604; Prairie clover as honey-plant 504; Price-jumping results in no sales 6; Price of honey held at 7c 198; Price of honey in Colorado 534; Price of honey, who fixes it 91; Prices for white honey recommended by Ontario committee 648; Prices keeping up 682; Prices of comb and extracted honey compared 34, 196, 617; Prices of honey in Texas 111; Prices of honey, Lilley on 47; Prices on water-white honey in California 420; profits from bees 115; Propolis as a medicine 450; Propolis from narrow-leaf cottonwood 106; Propolis, high price set on 32; Propolis less than \$5.00 a lb. 162; Propolis, origin and use of 568, 627, 652; Propolis removed with lye 473, 484, 752; Pump attached to power extractor 604; "Pure" no longer necessary on labels 228; Pyrographic outfit for fastening foundation 766.

Queen-breeder, opening for in Canada 453; Queen-breeder, trouble with 205; Queen, Byer's plan of finding 619, 719; Queen, care of when newly hatched 311; Queen-cell, drone hatched from 744; Queen-cell given to supersede queen 293; Queen-cell protectors 115; Queen-cells above comb honey, do they bring on swarming 490; Queen-cells over excluder, will they induce swarming 604; Queen-cells sealed early 664; Queen-cells should be placed opposite unsealed brood 484; Queen-cells, source of considered 550; Queen-cells, to get large number cheaply 171; Queen-cells, what is left in the bottom 550; Queen-eggs sent by mail 634; Queen-excluder, only three opposite use of 648; Queen-excluders, are they made too light 484; Queen-excluders, Doolittle on 715; Queen-excluders indispensable 40, 616; Queen-excluders not used by Scholl 632; Queen-finding sieve 451, 636, 666; Queen found wingless in spring 409; Queen freed from ball by being thrown in empty tumbler 196; Queen introduced by being given odor of old one 700; Queen introduced to old colony with no old bees 550; Queen introduction, A. C. Miller on 719; Queen, is she restricted in laying in spring 484; Queen, keeping record of, without book 655; Queen kept out of super without excluded 459; Queen kept out of supers by extra trick topbar 581; Queen larvae may have foul brood 343; Queen, laying capacity of 452; Queen lays more than one egg in a cell 473; Queenless colonies have much pollen 4; Queen long time on journey 397; Queen of a swarm returned to a hive 377; Queen reared during dearth of honey 551; Queen-rearing above excluders 114; Queen-rearing, business man's method 307; Queen-rearing, Doolittle on 749; Queen-rearing in March in Texas 135; Queen-rearing, questions on 342; Queens, A. C. Miller's observations on 522; Queens and drones dead, what wanted for 125; Queens balled when hiving swarms 323; Queens balled worse by black bees 389; Queens, balling of, serious in the tropics 654; Queens better if reared at home 241; Queens clipped lost from swarms 503; Queens clipped vs. unclipped 755; Queens, do they hatch same day swarm issues 581, 646, 661, 745; Queens, do they lay eggs that do not hatch 383, 418, 452, 516, 616, 660, 734; Queens, early, to rear 267; Queens, fat vs. slender 634, 646; Queens, finding, Byer on 619; Queens, finding, with carbolic acid 720; Queens, good ones must be bought 32; Queens, good ones reared under unfavorable conditions 495; Queens, how age of

affects swarming 497; Queens, how long do they live 355; Queen-sieve made of extra bottom-board 536; Queens injured by being sent through mail 241; Queens introduced by immersing in water 647; Queens, is it safe to clip when lizards are in the grass 405; Queens killed by king-birds 505; Queens laid more than one egg in a cell 536; Queens, laying capacity 355; Queens marked with paint 712; Queens, new way to keep out of super 450; Queens, old, all right 734; Queens, old, easier to introduce 646; Queens, old, leave voluntarily to die 666; Queens, plurality of for one colony 227; Queens, plurality of to prevent swarming 255, 322; Queens, quick way of finding 171; Queens raised above excluder 227; Queens reared at home the best 127, 293; Queens reared better with artificial honey-flow 386; Queens, rearing, in a super 636; Queens slow about laying 603; Queens spread laterally rather than vertically 160; Queens superseded in front of hive 648; Queens, supersede of newly introduced 654; Queens, surplus of, wintered 221, 436; Queens, to carry to outyard 441; Queens, to find, Doolittle on 454; Queens, trouble in finding, when there is danger of robbing 615; Queens, two, in a hive 563, 681; Queens, two wintered in one hive 636; Queen superseded in front of hive 583; Queen, supersede of, caused by poorly clipped queen 755; Queens, wintering surplus of 221, 436, 733; Queen, to catch, without touching 516; Queen, was she fertilized in hive 503; Queen, what becomes of, when superseded 473.

Rain in California 616, 748; Rain, scarce in California 5, 23; Reason of bees, McDonald on 587; Recipes in which honey is used 161, 198; Reciprocity, Byer on 649; Red clover bees work on red clover 149; Redlands, Cal., overstocked 5; Regrafting method of queen rearing 495; Reports, favorable 667; Re-queening after honey flow 733; Re-queening and securing feed for off year 564; Re-queening, plan for busy honey producer 492; Re-queening, wholesale, Byer on 619; Resting of bees between trips 720; Retail trade, demands of 89; Reversing combs to destroy cells 51; Rheumatism, bee-stings for 377, 591, 744; Ripening honey in hive 486, 664; Ripening honey outside hive 632; Robbers, Italians the worst 535; Robbers stopped by creoline 719; Robbers, to avoid when there is no honey flow 431; Robber-traps, what are they 484; Robbing, carbolic acid to stop 419, 516, 572, 615, 717; Robbing, ingenious way of preventing 630; Robbing, Italians vs. blacks for 503; Robbing, to stop, Edson on 40; Robbing, why bees tear the comb 196; Rocky Mountain bee-plant injured by sparrows 584; Roof aplary 247; Rope for hauling loads of honey 682; Roses and bees 258, 339.

Sage doomed 748; Sage has off year occasionally 61; Sage of California 23, 526, 625; Sages, correction on France article 681; Sales affected by appearances 17; Salesman, requirements of 523; Saw dust for winter packing 713; Saws, home-made 627; Screening bees in cellar causes trouble 25; Season unusual in Illinois 355; Second-hand cans 37; Sectional hive, one division of for brood-chamber 52; Sectional hives advocated 238; Sectional hives for comb honey, S. D. House on 401; Seeds of honey-plants, does it pay to grow? 61; Selling by national organizations, objections to 299; Selling honey at a good price, McGowan on 136; Selling honey at home 12; Selling honey, co-operation in 204, 376; Separator, Severin's honey and wax 756; Separators, not used 213, 343; Separators of perforated iron 151; Settling-tank, see gravity strainers; Shade-boards, cheap and effective 724; Shaken swarm plan without increase 151; Shaking energy into bees 421; Shaking swarms, proper time for 283; Shaking, useful after bees have swarming mania 322; Shallow frames advocated 238; Shallow frames, not liked 551; Shallow vs. deep supers 252; Shifting flying bees, Simmins' method 132; Shipping-case, double-tier, 2 1/2 in. galls preferred 517; Shipping-case, double-tier, voted for by Dr. Miller 354; Shipping-case, double-tier, honey not broken in 100; Shipping cases, corrugated paper in 199, 712; Shipping-cases, covers for 517; Shipping-cases, glass-front for show-cases 665; Shipping-cases in Vermont largely made of paper 163; Shipping-cases made of corrugated paper 198, 239.

296, 323, 485; Shipping-cases on end in the carrier 89; Shipping-cases,—size of glass 124, 386, 450, 551, 581, 582, 646, 647, 678, 728; Shipping-cases, twentieth-century 361; Shipping-cases used by Dr. Miller 418; Shipping comb honey, percent of breakage 355; Shipping full colonies 504, 634; Shipping long distance on unwired comb 205, 325; Shipping, necessity of having wired combs 95; Show-case, double-sided 660; Simplex-hive, how are closed-end frames secured 667; Skunks, poisoning of 748; Skunks troublesome in California 616; Sled, moving an apiary on 95; Sleeping of bees 663; Smoke and bees 537; Smoker, how to hold 474; Smoker, lighting with coal oil 648; Smokers carried under wagon-box 183; Smokers, holding between knees 63; Smoker, use and abuse of, Townsend on 277; Smoking at entrance 277, 322, 388, 435, 603, 604; Smoking bees from comb, Townsend plan 300; Smoking bees, I. Hopkins on 299; Smoking by rule impractical 597; Snow, abundance of on mountains in Colorado 199; Somerford method, what is done with queens? 52; Sorghum molasses safe if soda is added 309; Sour and sweet honey in same can 12; Soured honey, is it safe to feed 653; Souring of unsealed honey 636; Sour odor not from goldenrod 149; Sour smell caused by mushroom 333; Sour smell from aster honey 228, 257; South America, bee-keeping in 242; South Dakota convention 187; Sparrows injure Rocky Mountain bee-plant 584; Spider flower for honey 472; Spiders an annoyance 733; Splints as well as wire for foundation 322; Splints better support than wire 529; Splints, split bottom-bars in connection with 530, 614; Split sections in open top holders 311; Spraying blossoms, carrying bees in cellar during 160; Spraying blossoms near Marengo 237; Spraying cotton with paris green 537; Spraying sugar-beet kills bees 647; Spray-pump for bringing down swarms 505; Spring dwindling caused by loss of queen 283; Spring dwindling caused by poor honey 199; Spring dwindling caused by poor wintering 92, 266; Spring dwindling in California, prevention of 470; Staples for spacing frames 88; Stealing eggs from another hive 604; Steam knife tried and abandoned 572; Steam uncapping knife, objection to 451; Stinging, attitude of bee-keeper toward 650; Stings, what becomes of them 585; Stock vs. colony 418; Strainers, gravity, see gravity strainer; Strainers, Rambler's plan for 15; Strong colonies desert hive 51; Strong colonies for the flow of honey-flow 34; Success, poem 765; Sugar-beet spray kills bees 647; Sugar, brown, for bees 635, 646, 745; Sugar, price of 582, 616, 648; Sugar required to give certain amount of sealed stores 185, 257; Sugar vs. sorghum, for bees 309; Sulphur for fumigating, danger of using too much 572; Supers, arrangement of, Doolittle on 8; Supers, bees freed from by cold 618; Supers, comb or extracting, which bees start in quicker 732; Supers, do bees desert to keep themselves warm 664, 748; Supers, eight-frame, on ten-frame hive 584; Supers empty, where to locate 310; Supers, excluders under 537; Supers, how to separate when stuck 537; Supers, shallow vs. deep 252; Supers, T, from D. A. Jones 124; Superseding queen by use of queen-cell 293; Supersedure caused by poorly clipped queen 755; Supersedure of newly introduced queens 654; Supersedure, troubles from, in California 420; Supersedure, when does it occur 634; Supplies, advantage of ordering early 35; Swarm, absconding, how far will it fly 558; Swarm brought down with a spray pump 505; Swarm catcher made of Alexander veil 376; Swarm control by expanding or contracting 374; Swarm control, Hand system without bottom-board 207; Swarm, energy of when newly hived 263; Swarm, excluder for 484; Swarm flies 15 miles 727; Swarm having old queen and virgin 418; Swarm hived on combs from which it came 440; Swarm hived on the old stand 219, 237; Swarm hived with laying worker colony 376; Swarm hived with parent colony 115; Swarm issued three days before starting cells 661; Swarm prevention and bulk comb honey production 251; Swarm prevention, Hand's system 280; Swarm prevention, shaking and Heddon plan compared 270; Swarm prevention vs. control 621; Swarm prevention,

Wm. N. Miller's plan 372; Swarming and its cause, A. C. Miller on 560; Swarming baskets, Mendelson's modification of 329; Swarming controlled by tiering up 440; Swarming, Crane's plan to prevent 208, 237, 356; Swarming, does it occur after bees get started in supers 484; Swarming affected by age of queens 497; Swarming instinct varies in different strains 34; Swarming, is it brought on by cells above comb honey 490; Swarming, law of, formulated 457; Swarming, law of nature 616; Swarming prevented by bottom ventilation 211, 324; Swarming prevented by breeding 590; Swarming prevented by foundation under brood-chamber 258; Swarming prevented by proper care 182; Swarms allowed but increase prevented 257; Swarms almost unknown 67; Swarms, artificial in Switzerland 400; Swarms, artificial, made with bee-escapes 418; Swarms, beginners' questions on 474; Swarms caught by bait-hives 5; Swarms clustered together 376; Swarms, do they issue same day queens hatch 586, 646, 661, 696, 745; Swarms enter empty hives 257; Swarms prevented by decapitating brood 721; Swarms prevented by removing brood 718; Swarms prevented by shifting bees 471; Swarms prevented by triple-walled hives 241; Swarms, queer habitations of 420; Swarms that have lost clipped queen 503; Swarms that return to old hives 311, 439; Swarms, time of day they issue 64; Swarms, to catch 265; Swarms, uniting parent colonies 459; Swarms, weight of, on the average 744; Swarms, what happens when the queen is killed 297; Swarms, why were there none 699; Sweet clover chokes irrigating ditches 377; Sweet clover cow 247; Sweet clover for honey-forage 223; Sweet clover for horses 408; Sweet clover, Frank Coverdale on 730; Sweet clover, George Shiber on 727; Sweet clover in Colorado, who introduced 264; Sweet clover in Iowa 571; Sweet clover planted on sod 196; Sweet clover sown on waste ground 726; Sweet clover sown with other crops 502; Sweet clover, to teach stock to like it 472; Switzerland, artificial swarms in 400; Switzerland, large association in 646; Switzerland, pedigreed stock in 450; Syrup, 4 parts water to one of sugar 550; Syrup mixed in copper vessel kills bees 386; Syrup, proportions of for outdoor and indoor feeding 581; Syrup, tartaric acid in 744.

Tariff, effects of in Canada 197; Tariff on honey, Byer on 125; Technical World, Biegelow's article in 748; Temperature for comb honey, 680; Temperature in cellar 26, 169; Temperature inside of hive in winter 663, 664, 729; Temperature rises when bees are excited 124; Tennessee, conditions in 197; Tent, Greiner's portable 429; Texas convention report 408; Texas honey-crop prospects 238; Texas Mesquite, economic value of 530; Texas prospect 682; Thrips, do they destroy nectararies of flowers? 647; Time required by bees to make a trip 734; Toads a real pest in South America 242; Tobacco honey in Connecticut 268; Tobacco, odor of, kills bees 171; Tongue, functions of 664; Tools needed in bee-keeping 177; Top-bar, 1 9-16 inch thick keeps queen out of supers 581; Top-bar short, all right 386; Transferring by placing old hive above 283; Transferring, carbolic acid used in 717; Transferring direct into new hives, Townsend on 337; Transferring, Heddon plan of 634; Transferring, modification of Heddon plan 187; Transferring, trouble in 408; Transparent paper for comb honey 559; Trees, getting bees as well as honey from 590, 731; Tropical clothing 719; Tupelo gum as a honey-plant 596.

Uncapping box vs. capping melter 216; Uncapping by hand and by machinery, Townsend on 395; Uncapping for power outfit 272; Uncapping knife should have curved blade 583; Uncapping knife, steam, objection to 451; Uncapping knife, steam, tried and abandoned 572; Uncapping knife with wide-bevel 421; Uncapping machine tried by Townsend 395; Unfinished sections, reason for 26; Uniting, Dr. Miller's newspaper plan for 646; Uniting in the fall, Doolittle on 618; Unsealed honey, shifted in cells 664; Unsealed honey, will it sour? 636. Vegetable-cellar, bees in 635; Veil, Alexander, as swarm catcher 376; Veil needed after all 451; Vells, Scholl on 294; Ventilate, how



the bees do it 472; Ventilating cellar by drawing out stale air 113; Ventilation at entrance during winter 433; Ventilation during hot weather, Townsend on 75; Ventilation, is it required at the top? 450; Ventilation, lack of in cellar 25; Ventilation of hives 632; Vermont, European foul brood in 451; Virginia, information wanted about 148; Virgins, how soon they begin to lay 516; Virgin supersedes old queen 116.

Wages of apiarists 113; Wasp-nest in section of honey, Parson on 70; Wasps enter hives with bees 228; Wasps making much trouble 636, 733; Wasps, to poison 636, 646; Wasps work in section of honey 16; Water better than smoke for cross bees 744; Water in early spring necessary 238; Water needed even when thin syrup is fed 6; Wax, amount of, in old combs 636; Wax and honey, amount produced in U. S. 377; Wax from old combs, Doolittle on 64; Wax from slum-gum thrown away 5; Wax, purity tests for 488, 520; Wax, rendering with Hatch press 521; Wax, running bees for 76; Wax separator, Severin's 756; Weak colony, to make robber proof 26; Weighing device, automatic 661; Weighing-device, McIntyre's 114; Weighing-device, McIntyre's, objections to 160; Weight of different brood-combs varies 60; Weight of honey brought in each day 622, 745; Weight of honey consumed by colony in year 745; Weight of jelly-tumbler of honey 409; Weight of nectar carried into hive in season 744; Wheelbarrow for carrying 120 lbs. of honey 722; Wheelbarrow, home-made 527; White clover, plenty of in Texas 357; White clover thick near Marengo 354; White sage in California 387, 402, 552; Willow-herb and raspberry of Northern Michigan 102; Willow yields honey in Canada 389; Wilson, Mrs. Mar-

garet 659; Winds, cool, bees sensitive to 418; Winds in Colorado, cause of 62; Winter cluster below frames 151; Wintering colonies light in stores 765; Wintering, English methods 9; Wintering in cellar at 33 degrees 169; Wintering in cellar, Townsend on 43; Wintering in outer cases, Holtermann on 695; Wintering in single-walled hives in New York 171; Wintering in warm room 114; Wintering on summer stands, Tillinghast on 664; Wintering outdoors in New York 563; Wintering poorly causes spring dwindling 92; Wintering surplus of queens 221, 436, 733; Wintering two colonies in a box 636; Wintering two queens in one hive 636; Winter in Ontario severe 197; Winter, keeping tops of hives warm in 537; Winter-killing of clover 86, 266; Winter-nest, E. R. Root on 19; Winter nest, Foster on 62; Winter-nests, Crane on 745; Winter nests, peculiar 239; Winter nest varies in position 124; Winter nest vs. solid combs of honey 32, 65, 67, 97, 134, 135; Winter packing, cork-dust not suitable for 678; Winter packing, dry sawdust for 713; Winter stores, consumption of in Canada 266; Winter stores, making sure of in Danzenbaker hive 631; Winter ventilation of entrance 433; Winter work, McCain on 685; Wire-reel for wiring frames 238; Wires and splints for supporting foundation 322; Wires necessary in combs that must be shipped 95; Worker-cells vary in size 88; Worker comb torn down and drone comb built 293, 355, 485, 516, 680; Workers, drones and queens 145; Workers, how long do they live? 519.

Yellow sweet clover, both annual and biennial 376; Yellow sweet clover, good yield of honey from 164; Yew-tree as honey plant 343; Yield per colony, average 678; Yucca trunk bee-hive 75.

## EDITORIALS.

Adulterations of honey by glucose 482; Advanced Bee Culture, new edition of 158; Advertising, honest 415; Anderson, visit from 644; Answers and questions in GLEANINGS 580; Apiary, where to locate 319; Apicultural school in Massachusetts 351; Apiculture at Syracuse University 57; Apiculture taught at Ontario Agricultural College, Canada 193; Apiculture, the increased appropriation for 236; Appalachicola River in Florida 234; Appropriation in Ohio for foul-brood 193; Arcadia has to move 383; Australia bee-keeping 238; Automobile for foul-brood inspection work 383; Automobiles for bee-keepers 613, 709; Automobiles, transmission for 613; Avant plan for sucking honey out of combs 645.

Battle Creek paper on honey 353; Bee-culture at Syracuse University 57; Bee fixings too complicated 262; Bee journalism in America today 547; Bee-keeping for women 1; Bee-keeping in Australia 233; Bee-keeping in Maryland 547; Bee-keeping in New Zealand 57; Bee loss in Southern California 351; Bee-yard, locating 319; Bees and fruit 233, 513; Bees at the California apple show 643; Bees, black, not immune to European foul-brood 612; Bees by the carload to a warmer climate 57; Bees, color sense of 1; Bees, how wintering 194; Bees killed by spraying 447; Bees less in one apiary 289; Bees more quiet to handle under a cage than outdoors 612; Bees, mortality of in California 289; Bees moving short distances 352, 548; Bees not guilty as charged 513; Bees, shutting in hives during spraying 123; Bee-stings, are they ever fatal 580; Bees, why they do not go into supers 383; Beeswax, amount in drawn comb 711; Beeswax explosion 31; Beuhne on capping-melters 482; Bigelow has to move 383; Black bees not immune to European foul-brood 612; Black queens, how to find 447, 612; Blended-whiskey people 448; Boardman's feeder improved 483; Boardman's feeder to stimulate brood rearing 549; Brood-rearing hastened by slow feeding 483; Brood-rearing in the South 290; Brood specimens, sending, to Washington 260; Buckwheat a paying crop 548; Buckwheat in the comb not in demand 259; Bulletin from Maryland on bee-keeping 547; Bulletin on "Bees" 351; Bulletin on the honey-plants of California 709; Bulletins on foul-brood 320; Bureau of Entomology increase ap-

propriation 236; Buzz-saws and home-made hives 319; Byer on winter nests 157.

Cage, bees more quiet in handling under 612; California department 351; California, loss of bees in 351; California, mortality of bees in 289; California, rain and bad weather in 193; Canadian Bee Journal on eight-frame hive 2; Candied comb honey 29; Candy in queen cages for carrying foul-brood 481; Capping-melter and wax separators, improvements in 645; Capping-melters as viewed by producers 30; Capping-melters, how they discolor honey 482; Carbolic-acid solutions to prevent robbing 415; Carloads of bees to a warmer climate 57; Carniolans vs. Italians for the South 290; Cartons in shipping-cases 384; Caucasian vs. Italians for the South 290; Cereal honey, using honey for 676; Chaff hive, Root's old two-story 260; Charges against Wiley 449; Cincinnati as a honey market 123; Clover growing by Prof. Brooks 351; Clover taking a start 643; Clover, winter killing 86; Coffee, using honey 676; Collier's Weekly and comb honey 86; Colony short of stores, sugar too high 611; Color sense of honey bee 1; Comb honey and Collier's Weekly 86; Comb honey canard in Indianapolis paper 121; Comb honey candied 29; Comb honey, fancy 1; Comb honey grading, importance of honest 30; Comb honey in better shipping-cases 122; Comb honey that stands shipment best 260; Controlling swarms, J. E. Hand's method 385; Control of swarming 234; Convention of Indiana State Beekeepers 87; Convention, Ohio 1; Convention, Ohio State at Cincinnati 123; Conventions in Ohio and Indiana 29; Copy, surplus of for GLEANINGS 29; Corrugated paper in shipping-cases 85; Corrugated-paper shipping-cases of the Crane type 86; Cotton-plant spraying kills bees 579; Cover picture for November 15th 675; Crane shipping-cases 86.

Death of Hutchinsonson 353; Department editors, ours 58; Diagnosing at the entrance 416; Disease of bees, government on 2; Dr. Miller's new book on bees 514; Drawn comb, amount of wax in 711; Drouth in Florida 193.

Editor's department 58; Eggs, do queens lay unfertile 383; Eight vs. ten-frame hive, see Hive 261; Entrance diagnosing 416; European authorities confused on the two kinds of foul-brood 58, 59; Explosion of beeswax 31;

Extracted honey, other names for 260; Extracted, the name misleading 85; Extracted, various names for 3; Extracting by the Avant plan old 645; Extractor, largest in United States 415; Extractors equipped with honey-pump 676.

Fake concern, taking stock in 194; Fancy comb honey 1; Farmers' Bulletin No. 447, 351; Feeders for giving syrup slowly 483; Feeder with one hole perforation 483; Feeders with one hole to stimulate brood rearing 549; Feeding hot syrup for late feeding 675; Feeding outdoor to prevent robbers 547, 548; Feeding outdoors, caution concerning 580; Feeding outdoors, J. E. Hand scheme 514; Feeding slowly to stimulate brood rearing 549; Feeding sweet water outdoors, caution about 549; Ferguson's uncapping-machine to be tested 644; Fifty-year-old bee-keeper 259; Fifty years among the bees 514; First lessons in bee-keeping 611; Florida for sick people 158; Florida, good and bad land in 195; Florida, how to buy a home in 195; Florida mosquitoes, sand flies and fleas 234; Florida notes, No. 2 by E. R. Root 195; Florida notes by E. R. Root No. 3 234; Florida, people in 195; Florida, the northwest portion of 234; Foul brood, American and European 2; Foul-brood, American and European, to distinguish 320; Foul-brood appropriation in Ohio 193; Foul-brood bulletins by the government 320; Foul brood carried in queen cage candy 481; Foul brood, European authorities confused over 58; Foul brood, European, black bees, not immature to 612; Foul-brood, European, origin of 58; Foul brood, European, proof of its European origin 58; Foul brood, European, well named 58; Foul brood, extent of distribution over the country 236; Foul brood in New York, misstatement concerning 447; Foul-brood in Ohio 123; Foul-brood inspector, every one his own 418; Foul-brood inspectors for Ontario 321; Foul-brood inspectors of Ohio 481; Foul-brood law for Minnesota 321; Foul-brood law in Illinois 384; Foul-brood law in Kansas 233; Foul-brood law in Michigan 57; Foul-brood laws recently passed 236; Foul-brood legislation in Tennessee 321; Foul-brood legislation in Tennessee 85; Foul-brood situation in British Columbia 259; Foul brood, the Stewart method for treating 291, 292; Foul brood, where located in the U. S. 2; Foundation, the right and wrong way to hang it 259; France's annual report 29; Fruit and bees 233, 513; Fruit-trees, spraying while in bloom 121.

Glucosed-honey adulterations 482; Golden-all-over bees 415; Grading of comb honey, importance of honest 30.

Hand's new book 385; Hand's scheme for feeding outdoors 514; Harland, Marian, on honey 643; Harrington's buckwheat crop 548; Heads of Grain, fine type for 320; Heddon on sucking honey out of the combs 645; Herlong, R. W., death of 643; Hives, eight vs. ten 2, 261, 447, 677; Hives, having in pairs 319; Hives shaded in summer 710; Hive, ten-frame favored 1; Holtermann's mammoth extractor 415; Honey as a food and medicine 644; Honey, a staple or luxury 549; Honey cereal coffee 676; Honey companies, beware of 194; Honey cooking recipe book 29; Honey cooking recipes 157; Honey-crop conditions 385, 417, 449, 513; Honey-crop conditions for 1911, 352; Honey-croy reports 481; Honey for impaired digestion 644; Honey for patients at hospitals 644; Honey for typhoid patients 644; Honey in cooking 676; Honey, importance of selling early 643; Honey market 86; Honey market in Cincinnati 123; Honey, nomenclature of 3; Honey, nonsense about 353; Honey outlook for 1911, 319; Honey-plants of California, bulletin on 709; Honey-pump, advantage of, in extracting 676; Honey-pump for extractor 415; Honey, ripened artificially 611; Honey ripened by man or bees 676; Honey season poorest in many years 549; Honey, short-weight, and Uncle Sam 709; Honey statistics by the government 2; Hot syrup for late feeding 675; Hutchinson, in memoriam 353; Hutchinson's Advanced Bee Culture 158; Hutchinson, Mrs., sympathy for 447.

Illinois foul-brood law passed 384; Illustrated matter for GLEANINGS 29; Indiana State Bee-keepers' convention 87; Inspector, every one

his own 448; Inspectors of foul-brood in Canada 321; International congress of apiculture 447; Italians, golden-all-over 415, 416; Italian vs. other races of bees for the Southland 290. Kansas foul-brood law 238.

Land, most of it in Florida inferior 234; Langstroth's last surviving child 481; Laws for foul-brood recently passed 236; Long-tongued strain of bees 415.

McEvoy plan of treating foul brood modified 710; Mailing and introducing cage 481; Marchant's plan of moving bees short distances 548; Massachusetts school of apiculture 351; Michigan foul-brood law 57; Miller, Arthur C., booklet 547; Misbranding food products 482; Moving bees short distances 352, 543.

National bee-keepers' report 29; National Convention 384, 481; National Convention, next 233; Newman's "Bees and Honey" 611; New Zealand bee-keeping 57; Nomenclature of honey 3, 85, 260.

Ohio foul-brood inspectors 481; Ohio State Convention 1; Ohio State Convention at Cincinnati 123; Out-aparies more and bees fewer 289; Outdoor feeding, caution concerning 580; Outdoor feeding of thin syrup 514; Outdoor feeding to prevent robbers 547.

Paper shipping-cases, see shipping-cases; Parcels post, how it would help the bee-keeper 194; Pollination of flowers by bees 233; Poultry business, lessons learned from 262; Poultry raising and bee-keeping 1; Prices advancing 513; Pump for extracting honey 676.

Queen-breeder sending out disease 448; Queen-breeder's home destroyed 193; Queen-breeders agreeing to boil the honey in their queen-cage candy 675; Queen-cage candy to be boiled 675; Queen, can you find on the cover 644; Queens, black, how to find 447, 612; Queens, golden-all-over or three-banded 415; Question and answer department of GLEANINGS 580; Questions, answering 121.

Rain and bad weather in California 193; Recipes for honey, testing out 676; Recipes, honey cooking 29, 157; Reciprocity 383; Red-clover bees, with long tongues 123; Review, Bee-keepers', under new management 449; Ripening honey artificially 616, 676; Robbing held in check by carbolic-acid 415; Robbing prevented by outdoor feeding 548; Root, E. R., in Florida 158; Root, E. R., on Florida 195; Root's fiftieth wedding anniversary 579; Root's home in Florida 158; Root's two-story chaff hive 260, 261.

Saccharin barred from foods after July 1st 291; Saccharin barred from use in food after January 1, 1912, 481; Season poorest in many years 579; Sections filled out to the wood 260; Sections that stand shipment best 260; Shade for hives in summer 710; Shipping-cases better, crusades for 383; Shipping-cases, heavier and stronger 290; Shipping-cases of corrugated paper 85, 86; Shipping-cases, single-tier vs. Double 513; Shipping-cases stronger and better 384; Shipping-cases, Trickey on 677; Shipping-cases with cross-partitions of corrugated paper 122; Shipping-cases with the words "Comb Honey" on the cover, handle with care 677; Shipping-cases with 2-in. or 3-in. glass 513; Shrinkage and swelling of boards 121; Simmins' Method of shifting flying bees 121; Single-tier vs. double-tier shipping-cases 513; Smoking bees at the entrance 384; Sour odor noticed in hives 233; Spraying fruit-trees while in bloom 121; Spraying, how it kills bees 447; Spraying of fruit-trees, shutting bees in hives 123; Spraying of the cotton plant kills bees 579; Spraying trees while in bloom 259; Spring, backward 289; Starving of colonies because sugar too high 611; Statistics on the honey business 2; Stewart method for treating American foul-brood 291; Stings, are they ever fatal 580; Sugar, sharp advance in 579; Sugar, the sharp advance in 611; Supers, why bees do not go into 383; Swarm control by Simmins' method 121; Swarm control by tiering up 235; Swarm control, Wilder's method 259; Sweet clover as a producer of milk 193; Sweet clover, helping to spread the growth of 709; Sweet clover sent from the State Agricultural College of Ames, Iowa 58; Sweetening people with honey 123; Sweetening railroad men 122; Swelling and shrinkage of boards 121; Syrup, hot,



for late feeding 675; Syrup made thin for feeding outdoors 514.

Tennessee foul-brood legislation 85; Tennessee foul-brood bill passed 321; Ten vs. eight-frame hive, see Hive; Tiering up to control swarming 235; Tongues long of red-clover bees 123; Torch to kill bee moth 547; Trickey on shipping-cases 677; Twentieth-century bee-keeping, J. E. Hand 385; Type, fine, used in Heads of Grain 320; Tyrell taking charge of the Review 449.

Uncapping knife, steam-heated 159; Uncapping-machine to be tested 644; Uncle Sam's increased appropriation for apiculture 236; Uncle Sam chasing down the manufacture of bad food 482.

#### A. I. ROOT'S DEPARTMENT.

Abbeyville Sunday-school 639; Ads, whiskey, no longer in St. Louis Republic 382; Alfalfa honey in New York state 543; Alfalfa in Florida 84; American magazine, Ray Stannard Baker's article in 312; Anger and impatience 284; Apple orchard of 400 acres 539; Apples and apple orchard 346; Ants, Argentine, how to get rid of 120; Apples eaten by Pres. Taft 53; Apples for supper 640; Apple story 703; Apple tree that bore a wonderful crop 414; Arizona Gazette against the liquor interests 410; Automobile and the farmer 347; Automobile dealer and repairer 318; Automobile, priming wire for cranking 191; Automobile, Sear's 55, 118; Automobile, trouble with 284; Axtell, Mrs. L. C., letter from 445.

Bermuda grass for chickens 317; Bibles in Sunday-schools 735; Billy Sunday 477; Billy Sunday, what he does with his money 640; Blackberry, Northey 260; Boys and girls, Busch furnishing liquor to 380; Boys visit White House 313; Breakfast food for two cents a pound 510; Brewer and the Sunday-school man 512; Brewer crowns wife 229; Brewers' convention, Wilson delivers address at 707; Brewers' convention, Wilson honorary president of 544, 610; Brooder, simplicity 314; Buckwheat, criticisms concerning circular 545; Building, 55 stories high 739; Buttercup chickens 28.

Cellar drainage in Florida 27; Cherries as a substitute for apples 448; Chestnuts, roasted 706; Chicken business in Florida, possibilities of 152; Chicken-ranch, A. I. Root's in Florida 189; Chickens poisoned by toadstools 705; Chickens, profits from 772; Chufas 260; Chufas for chickens 608; Chufas in Florida 28; Cigarettes burned in bon-fire 610; Cigarettes cause fire 480; Coffee, artificial, how to make it 509, 510; Condition powders for poultry 512; Converts at Billy Sunday's revival 477; "Corn Clubs" for boys 312; Corn, parched, as a breakfast food 348; Cotton, Lizzie E. 479; Criminals, sterilization of 506; Criminals, sterilization of, comments on 701; Crows, are they friends of the farmer 350; Cuticura, a correction 511.

Dandelions no longer despised 637; Debts, minister did not pay 763; Divorce, Upton Sinclair's 606; Doctor's, high charges 770; Dragonflies 704; Drug business, government's chemist's opinion of 510; Drugs and medicines, of what real value are they? 154; Drugs injurious to babies 192; Drugs not needed for chickens 641; Drunken school boys in Newark 312; Ducks, water for 578.

Eggs, rotten, confiscation of 314; Eggs, tinted vs. white 447; Electropoise 738; Electropoise, testimonial in favor of 155; Express companies and the liquor traffic 511.

Feathers for brooding chicks 153; Feeding chickens, how much does it cost 349; Fertilizer—sitting hens ahead of incubators 673; Fertilizer secret 55; Fine of \$5,000.00 and a year in jail 512; Fleas, stick-tight, in Florida 154; Fletcherism 54; Flies as food for poultry 739; Flies, sand 154; Forecasting a laying hen 671, 739; Fresh air, value of for chickens 345.

Gardening in Florida during severe drouth 259; Gardening in Florida in the summer 609; Gardening in Florida the year around 447; Gardening in the north and in the south 738; Gold cure for intemperance 605; Golden wedding, anniversary of 638.

Veils and gloves more, less smoke 384; Veils vs. smoke 384.

Wagons, to draw from apiary when robbers are busy 675; Wax, amount of in drawn comb 711; Wax explosion 31; Weber on corrugated-paper cases 122; Wedding anniversary, Root's fiftieth 579; White, Dan, on bee-ripened honey 676; Wilder's method of swarm control 259; Wiley, Dr., and what he has done for the American people 291; Wiley, Dr. Harvey W., case of 448; Windbreaks for bees outdoors 675; Winter killing of clover 86; Winter nest and its relation to locality 157; Wire for frames 262; Women, bee-keeping for 1.

Habits, breaking bad 82; Happiness as cheap as ever 27; Hilton, Geo. E. 475; Honey crop prospects in South Florida 350; Honey vs. cane sugar 546; Honey, well ripened, value of 318; Hydrophobia, government bulletin on Impatience and anger 284; Indian Runner duck and the 100 egg record 317, 349; Indian Runner ducks, 705; Indian Runner ducks, both sides of the question, 446, 641; Indian Runner ducks, do they ever sit 674; Indian Runner ducks kept twelve years 382; Indian Runner ducks mating in shallow water 772; Indian Runner duck story 190, 230, 287; Indian Runner ducks, white 673; Intemperance, gold cure for 605; Investing in things that last 736.

Jail full when the town is wet 642.

Lanham's story 668; Lay sermon from Arizona Gazette 410; Lettuce, Grand Rapids 475; Lewis, E. G., and his league 119; Liquor business fought by former saloon keeper 642; Louisiana, fight for righteousness in 512.

Mail order houses 411; Marriage, Upton Sinclair on 606; Meals in open air 53; Meat and vegetable diet compared 771; Medicine not needed for chickens 380, 641; Memory, aids to 704; Memory failing 81; Michigan property, problem of selling it 442; Millionaires and the \$2.00 a day men 639; Ministers, sins of 767; Mulberries in Florida 188.

Nation, Carrie 575, 708; Nation, Carrie, her work 575; New York, trip to 573; Nuts and berries 231.

Oats for chickens 28.

Parcels Post 545, 640; Peabody, J. L., eighty years old 479; "Peace" Sunday 379; Peaches, many varieties of 539; Philadelphia, trip to 538, 573; Physical culture from common-sense standpoint 771; Pictures on covers of magazines 378; Poison, preacher gave to girl 767; Postum cereal coffee 509; Potatoes direct to the consumer 478; Potatoes on the "half shell" 740; Poultry houses in Florida 577; Poultry raisers, Leonard's hints to 705; Poultry secret 348; Prayers, how answered 188; Pullet lays when four months old 348.

Rape, Dwarf Essex 575; Rats caught by the hundred 737; Redbugs found in all parts of the U. S. 192; Redbugs, truth about 769; Redbugs, wet salt a remedy for 153; Remedies for chickens not needed 380; Revenue commissioner's report 232; Rice-growing in Florida 28; Rice, how to boil 231; Rice production in Arkansas 229; Rockefeller, would he help a poor man 639; Root, A. I., 71 years old 27.

Sage, Mrs. Russell 574; Saloon business fought by former saloon keeper 642; Saloon, why it should live 769; Sandy vetch in Michigan 414; Sears automobile with solid tires 413; Selling at a fair profit 508; Selser, visit with 538; Sex, control of in chickens, is it possible? 154; Sex of baby chicks, how to tell 348; Shoes, wooden-soled, for walking in wet grass 156; Simplicity hen's-nest and brooder 314; Simplicity Incubator 672; Sinclair, Upton, on the marriage question 605; Skinkrocket periodicals 544; Sorehead cured by Pond's extract 153; South Africa, bee culture in 737; Soy beans for chickens 608; Starvation remedy 605; Sterilization of criminals, comments on 701; Sterilizing criminals 506; Sulphur a preventative of vermin on chickens 153; Sulphur taken internally shows on skin 84; Sunday papers, funny sheets condemned 119; Sunday-school in Abbeyville 639; Sunday-school in

Florida 735; Surgical extortion 770; Sweet clover coming to the front 740; Sweet clover formerly considered a weed 637; Sweet clover in Florida 83; Sweet clover in Kentucky 260.

Taxes, what is done with the money 379; Temperance in Arizona 56; Temperance—relation to religion 707; The aeroplane a plaything for millionaires 546; Toadstools poison chickens 705; Tobacco and cigarettes burned in bon-fire 610; Tobacco voluntarily dropped 477; Tomatoes once thought unfit for food 637; Tuberculosis discussed at Cleveland convention 480; Two-acre farm, profit from 54; Two meals a day 53.

Vegetable and meat diet compared 771; Vinegar, Cary's manufacturing plant for 574; Votes bought and sold in Ohio 117.

Wall-paper trust 479; Watering 'poultry yard' 27; Weed seed getting on the farm 414; Wheat coffee, how to make it 509, 706; Wiley, shall he be dismissed? 479; Wilson delivers address at brewers' convention 707; Wilson, honorary president of brewers' convention 544, 610; Woman's National Daily and Lewis 258; Wonderberry, a good word for 154; Wright Brothers, up-to-date 674.

York, temperance letter from 707.

#### CONTRIBUTORS.

Abbott, D. W. 382; Acklin, Mrs. H. G. 220, 265, 324; Adams, L. W. 409; Aikin, R. C. 373; Aked, Rev. Chas. F. 299; Aldrich, Clayton 638; Allingham, N. 115; Ameiss, F. C. 487; Andrews, T. O. 700; Andrews, W. K. 408; Anthony, Stephen 12, 535, 766; Archibald, T. 387; Armstrong, F. J. 116, 490; Ashley, T. J. 505; Aspinwall, L. A. 394; Atkinson, Thos. 697; Auten, B. C. 221; Atxell, L. C. 445.

B., D. D. 667; Bachler, J. 151, 610; Bailey, G. A. 377; Bailey, W. T. 403, 558; Bailly, Otto 377; Baird, Mrs. Jessie 119; Balderson, Geo. A. 740; Baldwin, E. G. 129, 171, 213, 243, 279, 308, 361, 334, 398, 426, 461, 493, 525; Baldwin, F. M. 350; Barbisch, G. H. 115; Barringer, T. J. 100; Barron, H. C. 45; Bartlett, H. E. 223; Bartlett-Miller, H. 111; Bassett, Henry 535; Bearden, J. A. 597; Beauchamp, Mrs. J. W. 609; Beauchre, J. I. 67; Becher, J. A. 376; Bedford, Geo. H. 720; Bell, A. H. 504; Bennett, A. C. 667; Bennett, W. E. 151; Benton, C. D. 241; Berg, G. H. 504; Berghurst, Andrew 113; Bergquist, A. E. 278; Berntsch, David 472; Best, D. E. 371; Beucus, William 457; Beuhne, R. 489; Bigelow, Edw. F. 42, 628; Biles, Emma V. 28; Bixby, A. S. 156; Blair, Chas. P. 618; Blanchard, C. J. 272; Boddy, C. E. 739; Bond, M. E. 80; Bonney, A. F. 537; Boswell, S. W. Jr. 311; Bowen, A. H. 281; Bradshaw, R. D. 96, 588; Brady, J. F. 149; Brand, W. T. 151; Briggs, Fred 602; Brockmire, W. W. 490; Brown, L. M. 698; Brown, W. H. 251; Brown, Wm. C. 763; Bruennich, Dr. 72, 468, 687; Brumback, A. M. 572; Brumfield, J. P. 536; Bryant, J. E. 185; Bull, Mrs. J. W. 610; Bullamore, G. W. 10, 269, 556; Burr, Leslie 329; Byer, J. L. 65, 95, 114, 266, 325, 453, 619.

Campbell, Mrs. L. B. 504; Carbaugh, W. H. 603; Carl, Emma J. 508; Cary, H. 265; Case, J. B. 604; Cavanagh, F. B. 37, 77, 107, 130, 147, 375, 501; Chadwick, P. C. 23, 289, 387, 358, 398, 526, 426, 461, 420; Chambers, J. E. 182; Chapman, S. D. 435; Chase, G. C. 655; Cheney, C. D. 52; Chitty, Walter 729; Chrisler, J. B. 150; Christensen, Juan 242; Clark, Florence L. 740; Colien, E. E. 210; Colton, J. B. 409; Comstock, Anna Botsford 423; Cone, W. R. 408; Cook, Prof. A. J. 392; Cook, A. T. 480; Copeland, E. E. 377; Coterrell, J. S. 467; Coulter, C. R. 26; Couper, Wm. L. 437, 660, 697, 720; Coverdale, Frank 502, 730; Cowan, Thos. Wm. 119; Cox, R. V. 52; Cox, Wm. 50; Crandall, C. L. 734; Crane, J. E. 207, 296, 652; Crowder, J. F. 470; Crymes, S. H. 634; Curran, F. E. 26.

Dadant, C. P. 134; Darby, L. W. 297; Davenport, Stephen 48; Davidson, W. T. 459; Davis, W. S. 210; Dayton, C. W. 589; Dean, F. W. 227; Dean, W. E. 52; De Koker, A., Jr. 732; Demuth, Geo. S. 638; Densmore, J. H. 249; Densmore, Mrs. L. W. 609; Dent, Elmer A. 409; De Temple, F. W. 271; Dewey, C. R. 570; Dexter, V. V. 510; Diemer, J. F. 552; Dietzman, L. W. 408; Dillon, C. W. 536; Donaldson, J. M. 299; Douglas, Geo. A. 55; Dresser, Rev. E. L. 377; Driver, H. C. 150; Drosserts, Arthur 112; Droste, A. F. 558; Dunn, J. T. 203; Durham, W. W. 376.

Eddowes, Ch. Noel 460, 604, 654; Edgerton, Ben P. 601; Edgerton, E. F. 731; Edson, Chas. 40; Edwards, W. C. 473; Elliott, L. 636; Elliot, W. O. H. 524; Ensley, R. W. 661.

F., W. P. 571; Fagin, F. N. 504; Fittingling, Wm. 148; Flaig, T. F. 153; Flippo, J. H. 165; Foote, A. F. 348; Forsyth, Ben 572; Forsyth, Robert 666; Foster, F. H. 311; Foster, Wesley 17, 106, 183, 219, 247, 264, 323, 371, 388, 452,

406, 517, 566, 592, 665; Fouch, B. B. 278; Fox, Elias 731, 734; France, Frank F. 623; French, J. G. 440, 635; Fritz, Lucy M. 283; Furnas, W. C. 733.

Gardner, Fred 338; Gaston, Lucy Page 610; Gately, Leo Ellis 46; Gates, Dr. Burton N. 717; George, F. F. 52; Gettys, C. C. 631; Gibson, E. M. 527, 274, 721; Gietzen, W. G. 535; Gilham, D. C. 559; Gilstrap, W. A. H. 461; Gitchel, J. W. 441; Glanzmann, Jos. 120; Glascock, W. E. 56; Gooch, Mrs. Henry A. 766; Goodspeed, J. M. 639; Grabill, D. J. 604; Gray, F. A. 69; Gray, Mrs. J. A. 342; Gray, Joseph 228, 251; Gray, Theodore 474; Green, N. T. 441, 505; Greiner, F. 170, 202, 400, 568; Greiner, G. C. 133, 429; Griffin, H. 697; Griffin, O. B. 480; Griffith, Otis A. 40; Grubb, C. J. 473; Gunn, E. O. 187.

Haines, G. W. 403; Hallett, P. E. 667; Hallock, T. P. 48, 229; Hamilton, S. A. 186; Hand, J. E. 79, 135, 148, 280, 298, 374, 471, 515, 571, 621; Harber, W. H. 307; Harford, B. F. 572; Herold, A. D. 26; Harper, A. T. 667; Hart, H. F. 602; Hartl, Alfred L. 241, 252, 473; Harvey, Frederick H. 733; Hasselbach, A. E. 603; Hassett, Burdett 257; Hastv, E. B. 81; Hathaway, S. N. 16; Hawkins, T. J. 504, 636; Hays, Grover 372; Hedstrom, J. K. 204; Henderson, J. H. 116; Hendricks, John 733; Hickok, R. E. 377; Hill, Frank 116, 503; Hoffman, E. L. 441; Hogaboom, B. B. 420; Holland, R. E. 343; Holmes, Rev. L. P. 700; Holtermann, R. F. 361, 694; Hoover, L. H. 622; Hopkins, Isaac 96, 168, 299, 632; Hopper, Charles E. 733; House, S. D. 85, 209, 330, 368, 401, 433, 497, 533; Howard, C. H. 24; Howard, W. W. 310; Howe, A. E. 260; Howell, Geo. E. 447; Hugins, F. L. 110, 537, 764; Humiston, Dr. M. L. 151, 667; Hunsberger, A. C. 439; Hutchinson, W. Z. 393.

Isaac, C. 636.

Jacinto, Fred 324; Jameson, John M. 481; Jones, W. M. 192; Jennings, Kent 447; Jett, H. A. 226; Johnson, Hugh 228; Johnson, J. S. 666; Johnson, Lucille 754; Johnson, Thos. C. 512; Joice, G. W. 221, 342, 436; Jones, Benj. B. 156, 739; Jones, C. A. 113; Jones, O. J. 114; Joyce, E. T. 343; Judson, L. C. 256.

K., R. 636; Kalfus, J. W. 52; Keep, B. 666; Keith Mfg. Co. 546; Kent, M. L. 472; Kernan, T. 150; King, E. S. 349; Kinsey, Co. 348; Klinger, H. C. 566; Knowles, C. G. 26; Koch, August F. 603; Koogle, H. A. 766; Konrump, G. 187; Kreider, A. B. 154; Krone, H. 733; Kubitz, J. R. 185.

Lamkin, Lewis 733; Langohr, Frank 283; Langstroth, I. 186, 603; La Roche, L. 732; Larsen, Wm. 349; Larue, J. C. 472; Latham, G. H. 700; Lathrop, Harry 99, 521, 732; Lauritzen, E. 387; Layman, C. E. 139; Leavitt, C. E. 186, 342; Lesser, F. W. 700; Lewis, J. M. 593; Lewis, W. J. 660; Lhommedieu, Delbert E. 1, 365, 600; Libby, Horace, 722; Lilley, O. A. 512; Lillie, Jasper 47; Lind, John S. 26; Linde, R. 758; Lindsay, R. H. 634; List, L. 505; Littlejohn, W. H. 473; Loehr, Adolph 149; Longley, C. 256; Lovell, John H. 98, 339, 750; Lowe, E. 439; Lowry, John W. 209, 584, 601; Lowry, M. D. E. E. 477; Lubdorff, Otto 255; Lutes, J. I. 571.

Macdonald, D. M. 9, 499, 587; McCain, Robert B. 241, 685; McCalmont, Lizzie J. 473; McCarty, C. A. 734; McCubbin, J. C. 205; McDowell, Robert 259; McEvoy, Wm. 135; Mace, L. E. 502, 537; Macey, Louis 734; McGowan, J. A. 186; McJanet, R. 294; McMurray, T. L. 205; McNeely, J. C. 25; Marchant, A. B. 227;



Martin, Frederick 112; Martin, P. S. 343; Mason, S. 376; Matthes, Hans 14; Matthews, G. C. 206, 228; Matzke, F. E. 572; Mendelson, M. H. 329, 387; Merriam, G. F. 474; Messenger, W. H. 113; Metcalfe, O. B. 50, 75, 103, 142, 472, 224, 272, 302, 335, 367, 534, 557, 586, 667; Michener, Ila 228, 635; Miles, E. S. 67; Millar, D. W. 718; Miller, Amos 473; Miller, Arthur C. 522, 559, 560, 627, 654, 663, 719, 755; Miller, Dr. C. C. 97, 185, 270, 297, 376, 391, 490, 555, 571, 619, 630, 659; Miller, C. H. 727; Miller, J. E. 154, 184, 408; Miller, J. F. 51; Miller, Wm. J. 505; Milner, Wm. N. 372; Mills, A. I. 164; Mills, W. H. 546; Mitchell, Charles, 537; Mobley, R. L. 311; Mollett, W. C. 100, 298, 590, 635; Moody, H. A. 84; Moore, George Wm. 387, 719; Moore, J. F. 257; Moore, J. P. 555; Morgan, F. M. 164; Morgan, J. I. & G. E. 410; Morgan, R. A. 740; Moriarty, J. T. 186; Morris, W. C. 463; Morrison, S. J. 387, 524; Morts, C. R. 667; Moulton, T. E. 765; Munday, J. F. 218, 580; Munger, A. D. 422; Munger, Wm. P. 488, 520; Munro, James M. 256; Munson, Mary A. 247; Muth-Rasmussen, Wm. 635.

Nafziger, Jo. 311; Nash, Septimus 633; Neal, C. A. 149, 766; Neilson, D. 116, 153; Newman, H. J. 311.

Orton, Percy 563, 627; Otto, J. F. 449. Palmer, C. A. 80; Palmer, C. B. 38; Park, Otto A. 256; Parker, A. M. 51; Parker, J. N. 382; Parker, Wm. 747; Parson, A. S. 70; Patterson, J. A. 441; Patty, B. G. 537; Peabody, J. L. 479; Pease, G. F. 503, 535; Pellett, Frank C. 700; Pendraay, J. J. 228; Perkins, H. 495; Peters, K. 733; Phelps, C. W. 12, 690; Philippe, M. S. 440; Phillips, E. F. 404; Phillips, Dr. E. F. 716; Pierce, C. C. 752; Pierman, O. T. 635; Pierson, Barrett 228; Platz, Albin 537; Pollock, E. L. 169, 604; Porter, H. A. 113; Pouder, W. S. 149, 225; Powell, R. 327; Pruitt, M. E. 70, 111; Pryal, W. A. 105, 139, 248; Pulfifer, C. F. 96.

Railey, F. G. 438, 621; Rather, W. S. 441; Rav, Levi J. 491; Reader, J. C. 26; Reddett, Herrv 253, 726; Reed, W. H. 228; Rexford, O. S. 729; Rhodes, S. C. 115; Rice, Arthur 653; Rich, E. E. 116; Rich, Geo. W. 254, 653; Richards, P. W. 3; Ridlev, J. 150; Rinehart, L. 635; Rittenhouse, A. E. 155; Roberts, D. E. 183; Robertson, E. F. 724; Robinson, C. H. 472; Robinson, E. P. 222; Robinson, H. 257; Rolfs, P. H. 84; Root, E. B. 448; Root, A. I. 393; Root, E. R. 19, 93, 554, 751; Root, C. H. 257; Root, H. H. 49; Rossman, J. W. 208; Ruliffson, R. J. 305; Ryder, C. J. 259.

St. John, J. A. 186; Sawdy, D. A. 310; Saxer,

F. C. 765; Schmidt, B. F. 403; Schmidt, J. R. 591; Scholl, Louis 294, 357, 530, 486, 238, 530, 421, 633; Schroeder, S. P. 667; Scott, Warrington 656; Scott, W. H. 635; Sears, Loring P. 52; Sechrist, O. C. 382; Secor, W. G. 154; Selwyn, H. Harley 25, 254; Semper, J. Ford 341; Severin, F. J. 690, 722, 756; Seward, C. N. 696; Shattuck, E. H. 268; Sheldon, A. D. 42, 700; Shelhammer, J. A. 343; Shepard, A. D. 42; Sherman, I. Warren 258; Shiber, Geo. A. 14, 184, 492, 565, 727; Shields, W. M. 51; Silsbee, M. C. 697; Simmins, Samuel 132; Simmon, Dr. L. A. 686; Sladen, F. W. L. 761; Slease, R. B. 376; Smith, A. W. 186, 572, 603; Smith, B. F. Jr. 698; Smith, Dellon D. 311; Smith, E. S. 440; Smith, Jay 144, 728; Smith, W. W. 562; Snaveley, A. B. 380, 504; Snaveley, C. B. 202; Snodgrass, R. E. 166; Snowden, A. J. 699; Soper, Irma True 765; Southworth, W. P. 268; Staley, John E. 504; Stewart, Charles 448; Stewart, S. R. 114, 636; Stewart, W. H. H. 765; Stiles, Chas. H. 572; Stillson, H. J. 699; Stillson, The B. F. Co. 636; Stirling, L. L. 282; Stivers, Geo. 636; Stoerer, F. 227; Strang, H. F. 39; Stripsky, John 26; Swanson, Albert 150; Switzer, J. 377; Syverud, L. A. 503.

Taylor, John E. 439; Taylor, R. L. 393, 728; Tennent, H. D. 651, 730; Terhune, J. H. 473; Terry, T. B. 82, 509; Texera, A. V. 187; Thomas, G. W. 149; Thompson, R. 570; Tillinghast, Isaac F. 664; Todd, F. Dundas 21, 109, 144, 177, 208; Toman, Alexander 599; Townsend, E. D. 43, 72, 102, 137, 181, 216, 222, 245, 277, 281, 300, 326, 395, 409, 631, 653, 698; Trouslin, Mrs. M. S. 536; Tyler, M. D. 523; Tyrrrell, E. B. 375.

Valentine, C. S. 317; Van Horn, W. S. 257; Vickers, Dr. A. W. 738; Vickery, W. W. 622; Vollmer, Carl 446.

Wahl, Jacob 259; Waite, Elmer E. 282; Walker, J. M. 115, 588; Walter, Rev. Geo. A. 151, 328, 343; Warr, H. J. 370; Weatherwaks, Richard A. 52; Weaver, O. R. 408; Weblev, Frederick D. 485; Webster, Geo. H. 187; Webster, H. M. 114, 258; Weese, L. S. 697; Wendte Bros. 199, 240; Wheeler, J. 171; Wheeler, J. M. 603; Wheeler, Leon C. 69; Wheeler W. B. 610; Whitaker, E. H. 511; White, A. G. 258; White, Dan 684; Wilcox, W. C. 737; Wilder, J. J. 201, 251, 455, 596, 700, 763; Willcutt, A. E. 223; Williams, Mercie R. 602; Wilson, Jas. 610; Wilson, J. W. 697, 734; Wilson, T. W. 52; Wood, Geo. 187; Woolison, L. G. 699; Wright, H. R. 68; Wright, W. D. 409.

Yates, A. W. 716; Yoder Bros. 537; York, Geo. W. 477; Young, J. L. 253.

Zimmerman, G. I. 228.

## ILLUSTRATIONS.

A. I. Root and Mrs. Root 594, 595; Alfalfa, wild, in California 529; American Bee Products Company, apiary 464; Apiary and residence of Horace Libby 723; Apiary, Baldwin's queen-rearing 243; Apiary, Case's, Florida 462, 463; Apiary, Chase's 655; Apiary, Colien's 211; Apiary, Cotterell's, New Zealand 466; Apiary, Eddowes', in Jamaica 465; Apiary, Herlong's 461; Apiary, House's 209; Apiary, improving appearance of 139, 140, 141; Apiary, Isbell's 525; Apiary, Layman's 138; Apiary, Matthes' 13; Apiary, model British 498; Apiary of American Bee Products Co., Jamaica 464; Apiary on benches, Gibson's 274; Apiary on roof in Washington 247; Apiary, Piercy's 104, 105; Apiary, Poppleton's 365, 366; Apiary, Scott's 656; Apiary, Shoemaker's 142; Apiary, Shumard's 427; Apiary, Shumard's queen-rearing 429; Apiary, Simmon's in Arizona 272; Apiary, Smith's, Georgia 657; Apiary, Townsend's, Springbrook 180; Apiary wagon, Scholl's 532; Apicultural short course, Ontario College 433, 434; Aspinwall Hive 394, 432; Automobile, Cavanagh's Jackson 500.

Baby on a squash 370; Barrels of honey from apiary of A. B. Marchant 753; Barrels of honey in W. S. Hart's honey-room 333; Beans, soy 598; Bee-louse 468; Bee models 759, 760; Bigelow's apiarian laboratory 42; Black Mangrove 213; Blueberries grown in good soil 215; Boats for moving bees 363, 364; Boise Valley, Idaho 589; Bottom-board, Hand's, given practical test 657; Brooder, A. I. Root's Simplicity 308; Brood from seven-year-old

queen 331; Brushing bees from combs, Townsend's method 303; Buckwheat, wild 626; Button sage in bloom 526, 527.

Cage, Sladen's mailing 761; Capping melter, Haines' 404; Capping melter, large 217; Capping-melter, Severin's 692, 724; Carrying-cases 691; Cartons in twentieth century shipping cases 362; Catholic student holding swarm of bees 47; Cellar built entirely of concrete 562; Cellar, outside and inside of Townsend's 44; Chaff hive, old-style 271; Chaff-tray, Orton's deep 563, 564; Chart for purity test of bees-wax 520; Chayotillo vine 102; Colonies reduced to single brood-chamber 401; Comb being inserted in nucleus box 496; Comb, from which third queen just mated 497; Comb healthy that was formerly diseased 332; Comb honey produced by swarm in one month 206; Comb honey show-case 660; Comb honey wrapped in transparent paper 559, 560, 561; Combs mutilated by robber bees 250; Contracting brood-chamber, S. D. House's plan 368; Cottonwood, narrow leaf 106; Covers, metal-roofed, air-spaced 699.

Demonstrating with bees, Lucille Johnson's experience 754, 755, 756; Department editors of GLEANINGS 71; Disease, government illustrations of 405, 406; Dividing, simple plan for 310; Double-hive, Simmin's 122; Douglass, Benjamin W. 728; Drone, queen and worker 144; Dutch Dinner-table 15.

Eggs in the ovary of a queen 73; Electric motor for driving honey extractor 41; Entrance closing screen for shipment 623; Euro-

pean four brood, comb it started on 332; European foul brood, government illustrations 406; Exhibit of Orange County Bee Club, California 499; Extracting-house built like lumberman's shack 180; Extracting-house, Townsend's portable 137; Extractor cover of metal 603; Extractor, four-frame non-reversible 216.

Fair, Lucille Johnson demonstrating at 754, 755, 756; Fastening foundation, Gately's method 46; Florida, map of 175; Foul brood, American, government illustrations 405, 406; Foundation, Aikin's plan for fastening 373; Foundation cutter, Smith's 142, 143; Frame-nailing block, Scholl's 90; Frames, Chitty's reversible 730; Frames, loose-hanging, clamped for shipment 623; Frames, loose-hanging, device for spacing 699; Frame-spacer made of stamping 228; Frames, shallow, as used by S. D. House 401; Funnels for feeding bees 311.

Glove, cloth 179; Gravity strainer, Powell's 327; Gravity strainer, Townsend's 245.

Harper, W. H., and apiary 306, 307; Herlong, R. W., and Son 461; Hilton, Geo. E. 467; Hives, Bingham vs. Jones 360; Hives made from Yucca-trunk 75, 76, 77; Hives, parts of 21, 22, 23; Hives, ten-frame, used by Townsend 74; Hive, ten-frame made from eight-frame 342; Hive-tool 177; Honey and wax separator, Severin's 757, 758; Honey extractor cover of metal 603; Honey extractor driven by electric motor 41; Honey-house and work-shop in New Zealand 466; Honey-house, bear and ant-proof 493; Honey-house, Gibson's scheme for getting honey in 721; Honey-house over water 427; Honey-house, two story 658; Honey jars, various sizes of 17; Honey, Metcalfe's way of taking off 367; Honey-room, W. S. Hart's, showing barrels of honey 333; Honey-sac shown by bee model 759, 760; House-apiary, H. C. Longstreet's 493; House, S. D., in his bee-yard 210; Hutchinson, W. Z., and grandchildren 395.

Introducing cage, Sladen's 761; Italian colony that kept healthy in the midst of disease 331.

Jars, various sizes of 17; Jones, D. A. 93; Juniper stump, bees in 727.

Knife, Metcalfe's method of using steam-heated 273.

Ludloff's simplex hive 103; Ludloff's transitional hive 143.

Mailing cage, Sladen's 761; McIntyre's hive-weighing device 114; Manzanita blossoms 250; Manzanita bushes in California 249; Marble roof hive 249; Massachusetts Society of Bee-keepers 593; Mating hive, Perkin's "Mormon" 494; Mating nuclei, twin 690; Mediterranean flour-moth, work of 566; Mesquite of Texas 531; Mexican hive of Yucca-trunk 75, 76, 77; Mexican vine 102; Mexico, Shoemaker's apiary in 142; Migratory bee-keeping in Florida 363, 364; "Mormon" mating hive 494; Moth-torch, House's 532; Moving Apiarian Laboratory 43; Moving bees in Holland 14; Muscles of honey bee 687, 688, 689.

Nailing frames, Scholl on 90; Nailing, how to avoid splitting 763; Nucleus hives, Best's 372; Nucleus hive, S. D. House's 496.

Observatory hive, circular 729; Oklahoma association 338; Orange blossoms 174.

Orange trees 174, 176; Orange trees in Florida 398, 399; Orchard and apiary of C. E. Layman 138; Outdoor sleeping room 214; Ovary of queen, eggs in 73.

Palmetto, saw and cabbage 212; Pecos Valley Association 45; Phelps boys 691; Portable extracting outfit, Ensley's 661; Power-extractor, handling combs in 304; Propolis on cottonwood 106, 107.

Queen-catching device 516; Queen-cells, where located in sectional hive 368; Queen finding sieve, fits in entrance 666; Queen, seven-year-old, brood from 331.

Rabbit, to prevent from warping or splitting 91; Rheumatism, demonstration of bee-stings as cure of 591, 592; Robbers mutilate combs 250; Robbing, ingenious way of preventing 631; Roof apiary in Washington 247; Root, A. I., and Mrs. Root 594, 595.

Sage, black 625; Sage, button 526, 527; Sage, purple 626; Sage, white and hybrid 528, 529; Saw-table, home-made 627, 628, 629, 630; Screening entrances for moving, Foster's plan 371; Shade-boards, Robertson's 725, 726, 727; Shed apiary in Arizona 272; Shed apiary, California 692; Shed apiary in Florida 363, 398, 399; Shed apiary in New Mexico 276; Shipping cases, twentieth century 361; Show-case, comb honey 660; Simmin's double hive 132; Simplex hive, Carl Ludloff's 103, 173; Smoker-box under wagon 183; Smoker, hot vs. cold blast 178; Smoker, Townsend illustrating use of 276; Smoking bees from comb, Townsend's method 301; Split sections and open-top holders 311; Splitting of rabbit, how to avoid 91; Spring wagon for hauling bees 624; Steam-heated knife, Metcalfe's method of using 273; Sting muscles of bee 687; Strainer, Powell's gravity 327; Strainer, Townsend's gravity 245; Super, Metcalfe's way of carrying 335; Swarm on arm and hand of B. F. Schmidt 402; Swarm on branch of tree 428; Swarms early, cartoon 340; Swarm shaken on alighting board 305; Sweet clover cow 248.

Tarred-paper covering for cell-building colony 244; Tent, G. C. Greiner's portable 430, 431; Trailer for automobile 500; Transferring, Townsend's method 336; Transparent paper for wrapping comb-honey 559, 560, 561; Tupelo, scrub 596, 597.

Uncapping-box, McIntyre 216; Uncapping knives, Bingham vs. Jones 360; Uncapping-machine, Ferguson's 216, 396.

Veil, different types of 179, 181; Ventilating hive, Townsend's method 44; Ventilation, bees suffering from lack of 432.

Wagon extracting outfit, Ensley's 661, 663; Wagon rack for hauling bees 624; Wasp nest in comb honey 16; Wax and honey separator, Severin's 757, 758; Wax, chart for purity test of 520; Wax separator, Severin's 692; Weighing device, Ensley's automatic 661, 662, 663; Weighing device for hives 114; Wheelbarrow for carrying hives 337; Wheelbarrow, Gibson's 75 cent 530; White clover field in Iowa 467; White clover field in Texas 397; Willow-herb of Northern Michigan 101; Wilson, Mrs. Margaret 659; Winter-cases, Holtermann's bees in 693, 694; Winter flight from top of hives 564; Winter nest, ideal 19 and 20; Wire-cloth separator 369.



# Gleanings in Bee Culture

Published by The A. I. Root Co., Medina, Ohio.

H. H. Root, Assistant Editor

E. R. Root, Editor

A. L. BOYDEN, Advertising Manager

A. I. Root, Editor Home Department

J. T. CALVERT, Business Manager

Entered at the Postoffice, Medina, Ohio, as Second-class Matter

VOL. XXXIX

JANUARY 1, 1911

NO. 1

## Editorial

THE *Canadian Bee Journal* is growing better with every issue. Editor Hurley is putting some good work on it.

GENERAL reports indicate a snug winter over most of the northern States. The ground is covered with snow and has been covered in this locality for the last six weeks. An abundance of clover was reported last fall, and if the snow will only continue throughout the winter we shall have a bumper crop next year.

### EXTRA-FANCY PRICES ON EXTRA-FANCY COMB HONEY.

WE believe the time is coming when extra-fancy comb honey will be put up in cartons, and the cartons put in shipping-cases having corrugated paper, top and bottom. When honey is put up in this way it is almost sure to go through in good order. Dealers and consumers, as a rule, do not object to paying a fancy price providing *they get the goods that correspond with the price.*

### IN FAVOR OF THE TEN-FRAME HIVE.

WE are getting not a few endorsements of the editorial in our Nov. 15th issue, page 712, urging the use of the regular ten-frame hive rather than the eight-frame. The following letter is a sample of what is coming in from large producers:

I must say, after reading your editorial, Nov. 15, you have at last got on the right road, except the deeper frame hive you mention, which you will find to be a mistake in later years.

Colo, Iowa. DELBERT E. LHOMMEDIEU.

We also have assurances from some of the manufacturers that they propose to co-operate with us in working toward standards.

### OHIO STATE BEE-KEEPERS' CONVENTION AT CINCINNATI.

As will be seen by Convention Notices on page 26, arrangements have been made by Secretary Henry Reddert, to hold the next Ohio State Bee-keepers' Convention at Cincinnati with headquarters at the Grand

Hotel, Halis Nos. 1 and 2, on Feb. 16 and 17 next. A good program will be announced later. As there are a large number of bee-keepers in the vicinity of Cincinnati, there will doubtless be a large attendance. Bee-keepers from all over the State should make an effort to go, this year. Chief Inspector Shaw will be present and deliver an address on the foul-brood situation in Ohio. Other announcements will be made later.

### THE COLOR SENSE OF THE HONEY-BEE; CAN BEES DISTINGUISH COLORS?

WE have received, with the compliments of the author, a very interesting booklet, the subject matter of which is reprinted from an article in the November issue of the *American Naturalist*, by John H. Lovell. Our readers will remember the article on the bee's sense of color by Mr. Lovell, in our Sept. 1st issue, 1909. In this new treatise on the subject this original article is incorporated, and with it a complete history of a large number of exceedingly interesting experiments. Mr. Lovell is an original investigator, and his patient and painstaking work is helpful to all students of apiculture. His conclusions follow:

Bees plainly distinguish colors, whether they are artificial (paints, dyes, etc.) or natural ("chlorophyll") colors.

Bees are more strongly influenced by a colored slide than by one without color.

Bees which have been accustomed to visit a certain color tend to return to it habitually—they exhibit color fidelity.

But this habit does not become obsessional, since they quickly learn not to discriminate between colors when this is for their advantage.

### BEE-KEEPING FOR WOMEN, VERSUS POULTRY-KEEPING FOR WOMEN.

AT the last Ontario convention, a paper by Miss E. Robson, of Ilderton, Ont., on the subject, "Can women run an apiary?" attracted more than ordinary interest. In speaking of the advantages of bee-keeping for women she said:

Now for some of the advantages for a woman in bee-keeping. In the first place, unlike poultry-raising, all the work can be done in fine weather—in fact has to be done. Even in summer, unless during the busiest season, there will be a fair margin of time for other pursuits, and all the winter is free; the work is healthful, taking one into the open air, and keeping him constantly in touch with the great world of nature. It will yield a good profit for a comparatively small outlay. The chief capital required is brains and persistence; and, perhaps most important of all, the work is interesting, even absorbing. Can you imagine any thing more suggestive of peace and contentment than to stand in the midst of a bee-yard—one's own bee-yard—the

sun beating down warmly, the air heavy with the fragrance of blossoms, sunshine glinting on flashing wings, and the air full of a steady hum which rises to a subdued roar? Then it is, indeed, that we know what a goodly thing it is to be alive.

Even for the woman who does not wish to go into bee-keeping on a large scale, it can be made in most localities the source of quite a little income—especially desirable where there is a large family of girls, as well as providing a wholesome sweet for the table. I have in mind two friends who keep from ten to a dozen hives of bees, which on an average net them about \$100 a year. They winter outside, and leave the packing around the hives all summer, thus saving themselves much heavy lifting.

It is emphatically true that all the work necessary to be done with bees during the warm period of the year can be done in fine weather.

We wish to emphasize one other point, made by Miss Robson, that, in order to make bee-keeping a success, "brains and persistence" are required. She is emphatically right. We need more of both of these commodities in *all* walks of life.

#### THE CANADIAN BEE JOURNAL ON EIGHT VERSUS TEN FRAME HIVES; IS THE TEN TOO HEAVY FOR WOMEN AND ELDERLY MEN?

EDITOR HURLEY, in the November issue of the *Canadian Bee Journal*, gives his cordial support to our plea for standardization, and in particular the ten-frame L. hive; but he says that, in his experience, an eight-frame super filled with honey is about all he cares to lift; that a large number of beekeepers are women and elderly men, and that the ten-frame hive is too heavy for that class. He thinks, therefore, it would be difficult to eliminate the eight-frame hive.

While we admit that the eight-frame is a little easier to handle, so far as lifting is concerned, than the ten-frame, the *relative* difference is very small. According to modern methods of handling bees in connection with a wheelbarrow or cart, there need not be very much lifting, but, rather, of *sliding*. Frankly, it is our opinion that even the eight-frame full-depth Langstroth body when filled with honey is too heavy for the average woman or elderly man. Such people can hire for this heavy lifting a man at \$1.50 a day, and that lifting can be confined mainly to the time of taking off the honey. All other lifting that will be necessary can be accomplished by means of a light block and tackle, and a small tripod, such as we recently described in these columns.

Well, then, if all the important lifting can be accomplished by means of a light machine or a \$1.50 man, why not start out with the *right* hive in the first place—a ten-frame one? In putting on empty supers, one can handle ten-frame size as easily as eight. In the production of comb honey the supers will be only half depth; and that leads us to the point that a large number of extracted-honey producers are using half-depth ten-frame bodies for extracting. If these women and elderly men do not care to hire a cheap man, or fuss with a lifting-jack, they should by all means use half-depth extracting-supers.

It is well known that in a light honey-flow, or where the flow is very limited in duration, it is better to give a colony a half-depth super than one full depth.

Well, friend Hurley, taking it all in all, it seems to us that the ten-frame hive still has the advantage of the argument, both going and coming.

#### FOUL BROOD, BOTH AMERICAN AND EUROPEAN, AND ITS EXTENT OVER THE UNITED STATES.

The following has been given out for publication by the United States Department of Agriculture:

U. S. DEPARTMENT OF AGRICULTURE, }  
DIVISION OF PUBLICATIONS, }  
JOS. A. ARNOLD, Editor and Chief. }

#### WORK OF THE DEPARTMENT OF AGRICULTURE ON BEE DISEASES.

The honey bee annually produces a crop of honey valued at (at least) \$20,000,000, and there are vast opportunities for increasing this output. The most serious handicap to bee-keeping in the United States is the fact that there are contagious diseases which attack the brood of the honey-bee. There are now recognized two such diseases, known as American foul brood and European foul brood. From data recently obtained by the United States Department of Agriculture, it is known that American foul brood exists in 282 counties in 37 States, and European foul brood in 160 counties in 24 States, and it is estimated conservatively that these diseases are causing a loss to the bee-keepers of the United States of at least \$1,000,000 annually. This estimate is based on the probable value of the colonies which die, and the approximate loss of crop due to the weakened condition of diseased colonies. The States in which the diseases are most prevalent are California, Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Missouri, Nebraska, New Jersey, New York, Ohio, Pennsylvania, Texas, and Wisconsin; and it is unfortunate that these are the States in which honey production is most profitable, making the future outlook of the bee-keeping industry so much the worse unless active measures are taken to control the diseases. Furthermore, the distribution of these diseases is by no means fully known, and they are constantly spreading.

The cause of American foul brood has been found by the Department to be a specific bacterium, and enough is known of the cause and nature of European foul brood, which is also a bacterial disease, to make it possible to issue reliable recommendations concerning treatment for both diseases. Both attack the developing brood; and as the adult bees die from old age or other causes, the colony becomes depleted since there are not enough young bees emerging to keep up the numbers. When the colony becomes weak, bees from other colonies enter to rob the honey, and the infection is spread.

Both of these diseases can be controlled with comparative ease by the progressive bee-keeper; but the chief difficulty encountered in combating these diseases is the fact that the majority of beekeepers are unaware that any such diseases exist; they therefore often attribute their losses to other sources, and nothing is done to prevent the spread of the infection. It is, therefore, necessary in most cases to point out the existence and nature of the diseases, as well as to spread information concerning the best methods of treatment. Several States have passed laws providing for the inspection of apiaries for disease, and the beekeepers in other States are asking for the same protection, so that careless or ignorant beekeepers can be prevented from endangering their neighbors' bees. This inspection is a benefit in the spread of information concerning disease, in so far as the inspectors can cover the territory. The Department of Agriculture is helping in this work by sending out publications to the beekeepers in infected regions by examining samples of brood suspected of disease, and by sending out information concerning the presence of disease, so that beekeepers will be informed that their apiaries are in danger. The cooperation of agricultural colleges, State bee-keep-



ers' associations, and other similar agencies is being urged.

In view of the fact that these diseases are so widespread, every person interested in bee-keeping should find out as soon as possible how to recognize and treat these maladies, and be on the lookout for them. A publication containing a discussion of the nature of these diseases and their treatment will be sent on request to the Department of Agriculture.

Washington, D. C., Dec. 6, 1910.

The facts here given will be very interesting and valuable. Our Uncle Sam is doing bee-keepers a great service by the energetic way into which he is going into this.

#### NOMENCLATURE OF HONEY; SHALL WE "STAND PAT" ON "EXTRACTED"?

There has never been any question in regard to the terms "comb honey" or "candied honey;" and "bulk comb honey" seems to find favor with more bee-keepers than the less dignified and less accurate term, "chunk honey." But "extracted honey," as used to designate honey thrown out of the combs, has been open to criticism. Not a few bee-keepers, perhaps, in an effort to shorten terms, speak of "extract" honey, and we have even seen it on quite a number of letter-heads. This is bad policy in more ways than one, for it is suggestive of an article that contains some honey, possibly, but that is more in the nature of an extract—honey extract, etc. But, is the term "extracted honey" very much better?

Remembering that in the *American Bee Journal*, a number of years ago, this same question was discussed quite freely, we turned back and found in the year 1887 a large number of suggested terms, all of which were advanced by the various correspondents as being more suitable than the term "extracted." We give herewith a list of the adjectives that were suggested, some of which would be more appropriate for a funny paper than a bee-journal. Here is the list:

Combless, slung, uncombed, divorced, separated, centrifugal, free, squeezed, nectar, divided, clear, excomb, liquid, fluid, drained, expelled, extricated, extruded, strained, emitted, evolved, thrown, thrashed, rendered, bulk, loose, discharged, excomated, and selected. The number of communications on the subject, even at the start, almost overwhelmed the editor, Mr. Thos. G. Newman, and he suggested, after using two or three, that perhaps nothing would be gained by changing the term, and that the space might better be used in another way. The volley of letters did not cease, however, and so a little later Mr. Newman emphatically stated that he could not take space in the journal to prolong the discussion. We can imagine his dismay in finding that it was impossible to keep it down; for almost every issue from then on toward the close of the year contained one or more articles, each in all seriousness sounding the praises of one of the terms given in the list above. Quite a good many felt that the term "extracted" was good enough, and another class insisted that ex-

tracted honey should be known simply as "honey." In desperation the editor kept trying to call off the fight, saying that the matter should be dropped until it could be submitted to the National Convention in the fall, but his pleading apparently had no effect. We assume that the Convention, after considering all the terms, decided either that "extracted" was the best, or else that it had become so firmly fixed as to be impossible of change.

One of our subscribers recently suggested the terms "separated" and "separator," and these really appeal to us much more than "extracted" and "extractor." We give herewith his letter in full:

At home here we have fallen more or less into the habit of saying "separated" honey, and calling the extractor the "separator." The suggestion is offered for what it may be worth. The cream-separator is almost universally known and understood, and there is no prejudice against it. Centrifugal force does the work in each case, and the honey is just as truly separated from the wax as the cream is separated from the milk.

P. W. RICHARDS.

Mast Yard, N. M., Nov. 19, 1910.

We find that on page 476, *American Bee Journal* for 1887, Mr. T. Pierson suggested the same words and gave the same reasons for their use. Also, a little later in the year, another correspondent suggested these terms. We do not know that a change could be made, and we are not even sure that it would be advisable, although of one thing we are certain: However well fixed the term "extracted honey" is among bee-keepers, the average consumer of honey is unfamiliar with it—the less dignified term, "strained honey," being more popular, because it is really more used by the buyers of honey. Even in the advertisements of that glucose product *Karo Corn Syrup*, this "as-good-as" phrase appears: "Clear as *strained* honey."

All this goes to show, we think, that, to the average person, "extracted honey" means little or nothing. As a suggestion, would it pay all producers and dealers to have printed on their labels the following: "Pure extracted honey: (Honey thrown from the combs by centrifugal force)?" We realize that this might not find favor with perhaps a majority of producers, and it is very possible that our suggestion is not a wise one. However, of this much we are sure: In spite of all that has appeared in bee-journals during the last thirty years, say, comparatively nothing has gone out before the consumers of honey, to indicate that extracted honey means the same honey as that in the comb, the only difference being that it is separated from the comb. Some effort ought to be made to disabuse from the popular mind the implication that "extracted honey" means an "extract" of honey. This is not a point that is vital when the question of selling one individual's honey is considered, for the one individual may have no trouble with his particular class of educated customers; it is a point that concerns the whole bee-keeping fraternity.

## Stray Straws

By DR. C. C. MILLER, Marengo, Ill.

AS POSTSCRIPT to that entirely correct answer, p. 769, to Mr. Hansen, let me add that a queenless colony is just the one with the most pollen, because for a time the bees continue to carry in pollen for which there is no market.

MRS. ACKLIN does well to urge *State* laws against adulteration, p. 749. The United States laws come in only when bogus goods go from one State to another. A man can mix glucose and honey, and sell all he likes in his own town, and no law can touch him if there is no State law to do it.

G. M. DOOLITTLE, p. 783, if you think the hexagonal plan for an apiary the best, you might change your laying-out a little and make it hexagonal. Instead of moving your line ahead ten feet each time, move it 8 feet 8 inches. You will get more hives on the same area, and no hive will be less than 10 feet from any other hive.

MY HUMBLE apologies to E. M. Gibson and N. M. Chap, p. 754. If I lived where there is cold weather every night, I don't suppose I should want the big entrances that are all right here. Every now and then I wake up to the idea that the whole world is not located within 2½ miles of Marengo. But now, after eating this much humble pie, I want to say to you, E. M. G., if you ever meet me out on the desert in a dark night, don't you dare speak to me in a friendly way. I have it in for you on another score.

"THE SIZE of entrances will depend on the character of the cellar" leaves one guessing. In what character of cellar is there danger from too large entrances? [Say, doctor, you should not ask such questions. Frankly, we do not know; but we do know that the cellar or the means of ventilation have something to do with the size of the entrances. We observe this, that authorities differ greatly in their recommendations. You belong to the large-entrance crowd. We belong to the school that favors a smaller entrance. At all events, we have secured better results in a better-ventilated cellar where the entrances are about the size they are in the spring or late fall.—ED.]

W. H. MESSENGER says, *Review*, 365, "When you air-slack lime in a bee-cellar you *ventilate*." Chemical action sets free a lot of oxygen. [Is there not some mistake here? The chemical name for common lime is calcium oxide, with the symbol CaO. When it is air-slacked, as, for example, in a damp cellar, it will take on or absorb water from the air in the cellar, and any carbonic-acid gas that may be present. We then have the symbol  $\text{CaCO}_3$ . If we understand the chemistry of the proposi-

tion, no oxygen is given off; but when lime is put into a bee-cellar, in the process of air-slacking, moisture and carbonic-acid gas are absorbed. While this of course purifies the air it does not do it by *adding* oxygen, but by *removing* the products of combustion—that is, carbonic-acid gas from the breath of the bees. If we are wrong in our chemistry we should be glad to be set right.—ED.]

WHENEVER improvement in bees is suggested, such as breeding for non-swarmer, the cry comes, "Oh! you can't control the drones." Isn't that objection a little over-worked? True, drones can not be directly controlled. Indirectly they can be and *have been*. I grant you, much quicker work could be made with direct control of drones; but do you believe that you can persistently select queens with any one object in view and not in time have the drones affected thereby? Look at color. Couldn't control drones; but there are your bees, golden from tip to tip. I can't directly control drones; but I have bred from biggest yielders, and have thereby bigger crops. Do you think my drones are not improved? "They'll revert." Let 'em revert. Keep breeding against reversion. A perfect non-swarmer bee may never be; but a practical non-swarmer, just as well as a practical non-swarmer hen. So long as my record-yields come from colonies that make no attempt at swarming, I'm going to keep up the chase. [Good for you! We grant that *something* can be accomplished; but a strictly non-swarmer strain—well, we will wait for it.—ED.]

MR. EDITOR, you've made a good job of your "tentative propositions," page 779—might put more emphasis on pure air. Every year I think more of it, and am beginning to think almost any thing else may be wrong if the bees only have good food and good air.—[We submitted these propositions with the idea of having them criticised, so that, if they are accepted as correct by bee-keepers generally who winter their bees in the cellar, we may put them in permanent form in our A B C and X Y Z of Bee Culture and other literature. Perhaps some of our readers can add some other propositions to the list. More and more as time goes on it is being demonstrated that pure air is very important in wintering, either outdoors or in. At one time the whole fraternity went to the other extreme of putting in *too much* fresh air, or, rather, cold air, in a way that disturbed the bees. Then there came a time when it seemed to be accepted that bees did not need any air in the cellar—at least no more than would percolate through the walls; but the fallacy of that has now been shown up conclusively. While bees can be wintered in a good cellar where the temperature is maintained uniformly at 45, they will come out in much better condition if, with that uniform temperature, they can have plenty of fresh air.—ED.]



## *Bee-keeping in Southern California*

BY MRS. H. G. ACKLIN, GLENDORA, CAL.

Comb-honey production seems to be going out of fashion in our part of the State.

In hunting for pastures new, "look a leetle out" for Redlands. By actual count we found 5000 colonies on two sides of the town. Many of these are too far from groves to store much orange honey.

A bee-keeper told me recently that fifty swarms were caught near his apiary in one season. There are several live-oak trees near, and "bait hives" were kept out. He thought none of them were his own bees.

There is an old saying that hope long deferred maketh the heart sick. I wonder how many bee-keepers feel that sickness when watching for the gentle showers that have not come up to this time—December 8.

My! what a crowd! pages 726, 727, Nov. 15. But those vacant steps at the rear and sides look bad. Bring the National out to California in the near future and we will furnish enough more bee-keepers to fill a vacant space like that.

How about that pledge the State association gave the president of the Los Angeles Chamber of Commerce to put on exhibition a fresh supply of honey? If it has not been redeemed, how can we have the audacity to ask him to welcome us at our next meeting?

In answer to Mr. Crane, page 716, Nov. 15, I will say that many of our bee-keepers would not take the time or trouble to divide, but they do take care of swarms and do not want after-swarms; hence the "natural-swarm" man may benefit by my item on page 546, Sept. 1.

I got track of a man the other day who is actually getting rich on what other people throw away. He drives around to different apiaries and buys slumgum, takes it home, and, by an ingenious process, gets a fine grade of wax from it, and always has first-class beeswax for sale.

One of the happy surprises is the gentleness of the average bee in this climate. I have passed among the hives of many apiaries, and never yet had a following of "mad" bees. Sometimes half a dozen of us will be scampering around to find the best place from which to get a view, but never a bee bothers. Perhaps they realize

the importance of "looking pleasant" on such occasions.

I have been talking recently with different bee-keepers regarding a honey exhibit, from our section, at the State Fair. Some think it is too far to send honey, and others say it can not be sold to advantage after the fair is closed. I admit it is a long way from the southern portion of our State to Sacramento—about two-thirds the length, I believe; but I really believe it would pay to put in an exhibit up there. Let the whole southern part of the State unite in selecting fine honey, both comb and extracted, plenty to fill whatever space we could have, and then put some competent person in charge. If the premiums are as large as in some other States they will pay all expenses. Each bee-keeper should have his honey labeled; and among the thousands inspecting it daily there will surely be some buyers. I had considerable to do with State fairs for many years before locating here two years ago, and know whereof I speak. Let us be public-spirited, even if it does make us some extra work, and help out the fair officials with a fine honey exhibit the coming season.

How to keep extracting-combs in good condition when not in use is a question which has racked the brains of bee-keepers, north, south, east, and west, for many years; and in this climate, where Jack Frost seldom comes, it is a continual question. Mr. B. G. Burdick, of Redlands, president of the State association, has solved this problem to his own satisfaction. Almost any kind of building will answer the purpose if the roof does not leak and the sides are sufficiently open to admit of a free circulation of fresh air. If the building is light, screen wire will have to be used to keep flies from entering and soiling the combs. Comb-racks, securely fastened to the beams on roof, can run the entire length of the building. They should be a trifle narrower than the length of a top-bar so the ends of the top-bars can rest on them. There can be as many racks on the first tier as the width of the building will admit. More racks can be placed under the upper row if the strength of the supports above is sufficient. Hang the combs in these racks far enough apart to admit of a free circulation of air, and also far enough apart so moths can not nest between them. Mr. Burdick claims he brought through several hundred combs one season, in perfect condition, by this method. He also leaves combs in supers outside, stacked up so as to allow a circulation of air all around them, and far enough apart so they will not be attractive to moths for nesting-purposes. The nights being so cool here may be one reason why moths do not flourish under all conditions. If this simple method proves as effective with other bee-keepers as with Mr. Burdick it will be a great help to all of us.

## *Bee-keeping Among The Rockies*

By WESLEY FOSTER, Boulder, Colo.

Dr. Miller, I fear that even the editor has missed it this time in saying that Oliver Foster has been spoken of by me as "my father," p. 646, Oct. 15. Now, I have a father whose name is A. F. Foster, and he is a brother of Oliver Foster, so you may figure out the relationship. The Foster family have been bee-keepers since 1861, when father bought a hive of bees in a patent hive (with county rights to make them and sell them) of Edwin France. Father, in his first season of bee-keeping, got something like 140 pounds of honey from two colonies, and sold it all at about 25 cents a pound. My uncle Oliver, however, has been a bee-keeper for a longer term of years than any of the rest of the Fosters. I think legend has it that he got his start in bees by digging out a bumble-bees' nest in a red-clover field, putting the nest, bees and all, into a cigar-box and bringing them home to occupy a position on the window-sill of his room where he could watch their actions more or less by lifting the lid of the cigar-box and taking a peek. Any way, this swarm of bumble-bees now has increased (oh the marvel!) into something like two thousand colonies of bees located in various places of the irrigated West.

### UNITED EFFORT TO FIGHT THE GRASS-HOPPER PEST.

A movement is on foot to get something like ten or twenty thousand dollars appropriated by the State of Colorado with which to fight the grasshopper pest, which was the main cause of the honey failure in Northern Colorado this past season. The bee-keepers are letting their influence be felt along with the farmers and gardeners and fruit-growers. If we work concertedly for an adequate appropriation we shall get it, and the use of this fund under the direction of the Agricultural college will mean the difference between success and failure in years to come. When one sees orchards entirely shorn of their leaves and fruit, and the bark of many of the limbs and twigs eaten off, it makes him feel that our real enemies are insect pests and not some foreign nation. We are recognizing very fast where our danger lies, and, as a people, are overcoming obstacles that will make for better and worthier living.

### REQUEENING.

Not long ago I was talking with a bee-keeper who never clips his queens nor spends much time in looking after the age of his queens. He trusts to the bees for all this. He told me that no doubt he could get a higher average yield of honey, but that this work would require the time he would

spend in caring for a hundred hives of bees, so that if the extra hundred hives of bees make the difference in yield, he had lost nothing, and has kept his work in a simpler form. I am not sure this policy would do for all of us; but this bee-keeper makes it go very well; and as long as he can succeed better than the average he is not very likely to change his course.

### BEEES NEED WATER, EVEN WHEN HALF-AND-HALF SYRUP IS FED.

Why do bees visit watering-troughs, streams, etc., when feeding a sugar syrup made half and half, and this in August and September? One would think that they would have a great abundance of water from handling this comparatively thin syrup. The bees went in search of water this year after feeding commenced, whereas up to the time feeding began they were not noticed (to speak of) around the watering-troughs. But can the bees extract any amount of water from this syrup? Might it not be necessary for them to carry the syrup some distance before any water could be made available for the use of the bees in the hive? The syrup stimulated brood-rearing; and, in order to care for the young brood, water from outside had to be brought in. This brings up some interesting questions.

### "JUMPING" THE PRICE TO LARGE BUYERS RESULTS IN NO SALES.

I believe that bee-men are as fine a class of people as we have; but, in common with other rural and semi-rural dwellers, we have some "queernesses." For instance, when a buyer writes, asking quotations on a large amount of honey—perhaps as much as or more than we have, so that, in order to sell to him, we would have to buy of our neighbor bee-keepers—we think because he is in a large city, and has a good market, he will pay a higher price than the merchants nearer home, so we ask him a price higher than what we have been getting from local merchants in single-case lots. Of course, ordinarily we do not sell to the large buyer when adopting these tactics, for the large buyer figures on buying as cheap as others if not cheaper. So we keep our honey that we have jumped the price on, and continue to sell it a case at a time for the same old figure, and very likely the large buyer would have taken the whole crop at the figure, and saved us all the bother of small orders; but, no! we have not got over the idea that, if a man comes in search of an article in large quantity, we can jump the price up and get away with a little extra money. The man who lists his house for sale, and then every time a prospective buyer comes to look at it jumps the price, generally never sells. It's better to have one uniform price, and not try to get a little extra money from a man because he wants what we have. The chances are that he knows the rock-bottom price better than we do.



## Notes from Canada

By R. F. HOLTERMANN

### PINCHING BEES.

Doctor Miller, page 748, Dec. 1, I believe a pinched bee throws off poison scent, and excites the other bees in the hive, possibly for a long time, until they are ready to attack every thing suspicious.

### IN A CHEERFUL MOOD.

The editor must have been in a particularly cheerful mood (shall I say optimistic spirit?) when he penned that editorial in regard to my pictures, page 747, Dec. 1.

[We are always cheerful when we have stolen a march, or, rather, "got the laugh" on an old friend.—ED.]

### EXAMINATION OF FOUL-BROODY COLONIES.

The *British Bee Journal*, page 463, after drawing attention to some lawsuits in Ireland, refers to one case as follows: "In this case there is no objection raised to the Beepest Prevention act; but the bee-keepers object with considerable reason that their colonies should be inspected during the height of the honey-flow when the bees are in full work. The act provides that the bee-inspector should be allowed to come to examine the hives at 'all reasonable times,' and the regulations were taken by the county council to mean 'any time between April 20 and Oct. 31 inclusive, when the bees are flying.' The defendants contended that this was not a reasonable time, and that it would be a serious loss if the bee-inspector disturbed their bees when in full work, as they would lose three or four days after being thus disturbed. Of course, one can easily understand that bees disturbed at such a time must be impeded in their work; and a bee-keeper having a large number of hives would naturally suffer some loss. We do not see that there is any necessity for meddling with bees at such times; and the inspection can just as well be made either before or after the harvests so as not to interfere with the work in supers."

The above is so diametrically opposed to what we hold in Canada that I confess I never came nearer pinching myself to see if I was awake or dreaming when I read this. In this province (Ontario) the desire of bee-keepers, and their contention, has been to have the inspectors out only when a honey-flow is on; that at other times the bees are likely to rob and distribute diseased honey; and if the colony requires treatment then, it can be treated successfully with less trouble during the honey-flow, but robbing is the great objection. I fully agree with that contention. As to losing three or four days after an examination, the result of a mere examination can surely not be that. I would not be willing to admit even three or four hours' loss of time, particularly if

the combs were returned to the hive in the order found—no, not an hour would I admit lost.



### SHOULD A BEE-KEEPER HELP HIS NEIGHBORS TO START WITH BEES?

Our well-known friend G. M. Doolittle, page 752, Dec. 1, has an article on the above subject which contains a good deal of sound sense. I find that, from a business standpoint, to say nothing about a Christian standpoint, it pays to be honest and frank. It is neither honest nor kind to magnify or minimize the difficulties in connection with bee-keeping. To withhold all information and to refuse to answer a question which can be answered briefly by even a busy man is petty. However, I do feel that there are bee-keepers who have spent much money in gaining experience, traveling to conventions, and experimenting. For instance, I do not feel called upon to sit down when I can not do all my own work fully, and educate some one else for nothing; neither would I allow any one else to do this for me. For years I have felt very strongly that it pays a man who wishes to specialize in bees to learn the business from a specialist and not acquire every thing by dearly bought experience; and I for one have not felt like teaching some one my business and allowing him any more than actual expenses while doing so. Bee-keeping is a profession. A man does not secure an education at considerable expense, and then charge nothing for instructing others. The bee-keeping industry has been brought to its present condition, not by governments and government help, but by individuals giving out what they have learned. The safeguard against undue competition in bee-keeping lies not so much in keeping methods of success secret, but in the fact that not many will carry out those methods. Those who realize that their crop has been produced as a result of money invested, as well as of thought, time, experience, and labor, should be willing to share their knowledge; but they have a right to consider it worth all that can be secured for it in the market.



### NOTES FROM CANADA.

With these notes I expect to withdraw from this department. To conduct such a department properly requires a good deal of general reading, and for over a year my plans have been in the direction of having entire liberty during the winter months for gospel and Christian meetings, and to be able to accept invitations in scattered and needy sections where not much financial aid could be given to Christian work or special help secured for special meetings.

[We are very sorry to lose our correspondent. His extensive experience, coupled with his habit of close observation, has enabled him to give to his brethren of the profession not a few tricks of the trade. We wish him God-speed in his new work.—ED.]

## Conversations with Doolittle

At Borodino

### TIERING SECTION SUPERS.

In one of the papers I see that some of our best bee-keepers tier supers of sections by raising the first super (on the hive) and putting the second one under. Then, later, if more are needed, the third is placed under the second, and so on to the end of the season. Last summer I tried the plan, being told that the bees would almost invariably fill the top super before commencing in the lower one, and that the top one, when completed, could be taken away, and a third put under the second, if the season held out favorably. But the end of the season proved that the bees had filled the second super put on, doing very little more in the first. Can you tell me wherein I failed?

Undoubtedly you failed from not having your colonies strong enough when you put on the first super; for it is evident that the bees never occupied that first one before you raised it up and put the second super under. Or, if strong enough, there was no nectar coming in from the fields, or, at least, not enough so that the bees were inclined to draw the foundation and store their honey there. But your greatest failure came from not knowing just what you "were at." In other words, you did not work in the right way to succeed in what you desired to accomplish. Had your second super been placed underneath at the proper time—that is, when the sections in the first super were about two-thirds completed, the bees, if the colony was in suitable condition to receive more room, would have taken to the lower sections at once, and commenced to draw out the foundation; and if the yield of nectar kept on, they would have continued to work without interruption, storing and finishing the sections in the first or upper super the same as if the other had not been placed under.

Frequently it will be found that, where the colony is strong and the season extra good, from one-half to two-thirds of the sections in the lower or second super will be also ready for removal. Now, if those not fully completed at the sides are placed in the center, and a third super put under, the work will go forward in the same manner as with the first, and so on to the end of the season. It is natural for bees to build comb downward, and to extend it gradually in a lateral direction. For this reason they almost always commence drawing out the foundation in the center of the super, where the hive below is filled with brood centrally; and, as they progress, honey is stored in these center combs, and at the tops of the sections on either side; therefore the center combs, and the tops of those further out, are sealed first, and this is why it is well to change the sections from the center to the outside, and the outside sections to the center, where there is plenty of time for such work. However, if "bait" sections are properly used in the first super put on, with a colony running over with bees when the

harvest commences, there is little need of this exchanging of sections till near the close of the season, as, with bait sections placed two-thirds of the way from the center toward either side of the super, all sections will be sealed at so nearly the same time that it will not pay any one whose time is worth \$2.00 a day to fuss with the changing of sections in the early part of the honey-flow.

Some bee-keepers prefer to put the second super on top of the first, and I myself am quite inclined that way; but I shall have to admit that the majority of section-honey producers usually raise the partly filled supers and place the empty one between these and the hives. One of the reasons given for this is that, in this way, swarming is more readily delayed, if not entirely prevented, as by this plan room is also given for the bees, so that they do not become overcrowded.

Another reason why the supers are moved up is that, when sections are finished close to the brood, they become soiled, or what is often called "travel-stained," by the bees walking over the darker brood-combs below, and from these immediately on the nice white sealed sections above. But when the supers are tiered, the white sealed sections are so far away from the brood-nest that they remain in their beautiful condition until the whole super can be removed. However, I find that the size of the hive or brood-nest used has very much to do with this matter. Where a small hive is used so that the queen breeds clear to the top-bars of the frames, and continues thus to the end of the season, this reason will hold fairly good with all colonies having old combs; but where the hive is large enough to insure a liberal allowance for winter stores, there is generally an inch or more of sealed honey along the tops of the combs below the supers, in which case this travel-stain is largely a myth.

There is one part of this tiering-up process (usually not spoken of) which I consider of very great importance. The tiering should be done with a view to the greatest success. With such a view, no empty supers will be placed underneath those partly full toward the end of the season, for, if so done, the result will be, nine times out of ten, nothing but a whole lot of lean and unfinished sections at the end of the season. When the season is drawing toward the close, and yet there is a possibility that the bees may need more room, always place the empty super *over* the one the bees are at work in, and in this way catch the "overflow," should such happen to come; and if it does not come, or the season stops more abruptly than usual, then the larger part of the sections the bees have commenced work in are salable. How may we know just when the flow of nectar will stop? No one can foretell; and this is the reason that some prefer to be always prepared for a sudden stop in affairs by placing *all* empty supers over those in which the bees are at work.



## General Correspondence

### ENGLISH METHODS OF WINTERING.

#### Absorbent Coverings Preferred with a Dead-air Space Around the Side Walls Instead of Packing Material.

BY D. M. MACDONALD.

The subject is a complex one, yet I think we have solved it in these islands in the only possible way for us, and we will vote almost unanimously in favor of absorbents. But then your State of Ohio centers on 40° north latitude, while we here in Banff are about 57.5°! It is very interesting to add that the British Isles stretch from 50° to 60° N. Just fancy—a fact not often realized—the south of England is on the same parallel as Winnipeg and the north of Ontario, Quebec, and Newfoundland, while *our* parallel runs through the south of Greenland, the center of Hudson's Bay, and the very north point of Saskatchewan and Alberta. Judging by the degrees north of the equator, *we* should be almost in the arctic circle compared with Medina. But from several interesting causes which I need not dwell on we really differ little in climatic conditions from you. We would never dream in this country of wintering in clamps or cellars, and all our bees are wintered on their summer stands with very little packing in addition to that used in the heat of the season. Our success, I think, depends a good deal on two very important points, if not three. Perhaps it might be considered presumptuous in me to assert that in these respects we are ahead of you, so I will let the facts speak for themselves.

The main point, I think, to be attended to in securing safe wintering is the top of the brood-frames. There is the chief point of weakness. Heat is generated by the bees in the hive; and to give the colony the best chance of living in comfort, and surviving the rigors of our severest winters, we must preserve the internal heat by every means in our power. No draft may play through the brood-nest escaping upward and conveying the life-giving heat. We generate animal heat in our own bodies unconsciously; but to preserve it on nights of zero cold, we must wrap up snugly beneath warm woolly blankets over linen sheets. Here is our ideal for the bees. Cover the tops of frames with a calico quilt, then over that place from three to six layers of warm woollen cloth, and you have just what the bees require to keep them in the best heart in an arctic cold. Too heavy a pile of blankets tends to make mankind uncomfortable; too many heavy coverings incommode the bees, and fail to secure the ends we are striving for. The nearer you go to "hermetically" sealing up the body under a press of heavy

coverings, the nearer you get to defeating the very end you are striving to attain. The body becomes bathed in perspiration, and discomfort follows. Bees breathe all over the body, and if their primary and secondary organs can not get full play they are not wintering under favorable circumstances.

Now, here is just where the nature of the roof of the British hives scores against those generally used in America. I know your chaff-hive roof has a clear space above the packing; i. e., the roof does not press down the planer shavings, forest leaves, or cut straw generally used. But it lacks the depth of our span roofs, and, moreover, in general we are not content with even that depth, but employ a lift of about six inches. That affords a large space of nearly dead air above the covering, affording ample means of ventilation. Further, to aid this essential to safe wintering, our hives have auger-holes pierced in the gables, back and front, to act as ventilators, and they thus afford an opportunity for the vitiated air to escape. These two points, the deep space over the covering and the ventilating-holes, covered, by the way, with perforated zinc, or with cone escapes as a general rule, mean more than at first sight might be supposed.

The ample covering over the frames preserves the heat of the hive, yet it does not prevent a gentle percolation of the heated atmosphere through the porous coverings. The vitiated air thus finds a way out overhead, and fresh air is introduced in such measure as the bees deem necessary. Their keeper, of course, aids them by contracting the entrance by means of slides in zero weather, or by enlarging it when the temperature is high. A fairly large actual entrance is provided on the approach of winter; but it is contracted partially to prevent snow drifting in and hinder the ingress of vermin by perforated zinc being tacked on above the slides, affording only about one inch by  $\frac{3}{8}$  in. as the space left open for the bees' exit and entrance. The nature of our packing overhead, and the ample "attic" space, are the two points I specially specified at the start. The third is the open space between the outer and inner bodies of our hives. Take a W. B. C. as a typical one. The wood employed might, perhaps, be deemed too thin for our rigorous climate, being only half-inch boards; but practice proves theory wrong here, for even in our northern latitude we are content with the dead-air space between the outer and inner body boxes, and never think of packing between the walls. Elaborate experiments were formerly made to test this, and all kinds of material used; but the end of it is that now the dead-air space is deemed sufficient. It must be granted that two half-inch boards, with a space of two or three inches between, will prove warmer, and in several other respects more desirable than a single board one inch thick. Yet another point deserves notice. A deep bottom space is favored by many on your side. Well,

this hive has a three-inch eke placed beneath the inner or brood-frame box, allowing that amount of aerating space below the winter cluster.

Condensed moisture settling on the inner ceiling, or even on the walls, of such a hive as I have described, is rarely if ever observed; and, indeed, I think it is next to an impossibility, during even a continuance of zero weather, or in course of a prolonged snowstorm, when the hives are buried in snowdrifts for weeks together. Some add a bottom ventilator capable of being opened or shut when desired; but I have never yet discovered any need of its use, although in a moister climate with a higher temperature at times it might work for good. Neither do I use a Hill or any other device for the tops of frames, as there is a tendency to draft unless coverings are extra carefully attended to; but I leave on all brace-combs above frames during the winter to provide winter passages for the shifting cluster to work around to new sources of nectar if they require it when long confined.

I do not adopt an antagonistic attitude toward sealed covers, as I have wintered bees here safely in my own Langstroth hive, but not with such an ideal measure of success; and I have now provided a lift, and practice the more successful plan with it. I tried American oilcloth unsuccessfully. Boards placed close over packing proved an evil. So did such materials as old magazines used liberally. Glass quilts overhead had a fair trial. Bees came out fairly fresh and strong; but the expense as well as the worry entailed taught me to discard them as inferior all around. Convinced as I am that the three points I have touched on all tend toward successful wintering I submit them to your readers, and trust something may be done to test their value on your side. The wintering problem is a trying one at best, and every one who provides some food for thought advances the solution one step further.

GLEANINGS advocates a vestibule or outer chamber in connection with cellar wintering, whereby the chill outer air is modified before it reaches the inner room in which the hives are deposited. In general, bee-cellars are below dwelling-houses, or have some workroom above; consequently these apartments are ideal winter receptacles, because the inner sanctuary is aerated gradually, pure air being permitted to enter only after its severe temperature has been raised to something approaching 45°. Most consider this works most successfully for the bees' well-being.

Now, here is this W. B. C. hive with a layer of pure air above, below, and all round on every side of the inner body boxes. The chill is taken off the fresh air previous to its entrance, so that no rude lowering of temperature attends the entrance of the volume of air carried into the hive interior. The dead air all round the brood-nest body secures an equable temperature, while the deep space overhead, aided by the ventilat-

ing cover, allows the vitiated air to be dissipated almost insensibly. The idea of a "lukewarm" air-space around the brood-nest body already exists with you in a crude elementary form in the system practiced by some bee-keepers in Northern States where they "clamp" their hives, and, to a certain extent, in a modified form when they enclose their hives in winter cases.

Banff, Scotland.

## NATURAL SELECTION AND DISEASES OF BEES.

The Meaning of Immunity; Why Certain Strains of Bees Become Immune.

BY G. W. BULLAMORE.

The majority of bacteria obtain the nutriment necessary for the carrying-on of their vital functions from dead animal or vegetable matter which they break up into simple compounds. Some of them are found in the cavities of living animals where they lead an apparently harmless existence with no power of invading the living tissues. Others have developed this power and can attack living protoplasm. This latter class are the pathogenic or disease-producing bacteria.

Some pathogenic bacteria are capable of leading a harmless existence on dead matter, but set up disease when they gain an entry to the living body. Others are incapable of growth apart from the host except under highly artificial conditions; and as their object is to live and multiply, it is obvious that the death of the host, although caused by the bacteria, is a misfortune which tells against them.

The power to resist bacterial invasion is an attribute which varies with the individual; and, when present to a marked degree, constitutes immunity.

It must be clearly understood that immunity and vigor are not the same thing. Although the breakdown of health may mean loss of immunity, no amount of vigor will protect a susceptible individual if the right germ comes along.

Immunity is of two kinds. An attack of disease often renders the individual immune to that disease for the future. This is acquired immunity. The other kind is present without such stimulus, and is transmissible to offspring. In the study of bee-disease it is the latter kind with which we are interested.

When a disease visits a district for the first time, all the very susceptible stocks are killed. The immune (if any) and those capable of recovery perpetuate the species. Successive epidemics will weed out those who revert to susceptibility, and a balance is at last established in which the disease, although propagated at the expense of the stocks, is not sufficiently virulent to inhibit the production of honey and swarms. The bee and the bacilli become mutually adapted, and the disease becomes endemic. If



exported to hitherto unvisited districts it will still manifest itself as a serious epidemic.

According to Mr. T. W. Cowan, the senior editor of *The British Bee Journal*, foul brood is endemic in Italy, and the exposure of diseased combs to robber bees is not followed by any serious consequences in that country. In some parts of England also, a form of foul brood is endemic. It is probably present in all large apiaries, and can best be detected in spring. Later in the year, in normal seasons, the combs are cleaned up. Affected colonies sometimes swarm, and the surplus yield is often up to the average.

The experiences of American bee-keepers go to prove that the immunity of Italian bees to one form of foul brood is greater than that of the black bee. Brother craftsmen in Switzerland find that the susceptibility of the yellow bee is greater than that of the black with regard to the type of foul brood present in their district. I understand that these Swiss yellow bees are natives of the district, and it would be interesting, therefore, to know what micro-organism is concerned in the trouble. If it is the one to which the ordinary Italian bee has a partial immunity, then the explanation is that the disease has recently arrived in the valley. On the other hand, the trouble may be due to the bacillus of a disease which has "run its course" for ages among black bees, and is now starting a natural-selection campaign among the yellows.

We can best understand the present state of affairs by supposing that different races of bees in the past have developed their own endemic diseases. These diseases have been kept distinct by the natural boundaries that have kept the races of bees from intermingling. Although the endemic disease of the black bees (*B. larvæ*?) may have been present in the original skeps brought to America, its mild character would not bring it into notice. In crossing the continent, however, the swarms escaped for many generations from the selective influence of the disease, and the consequence has been a reversion to greater susceptibility.

With the introduction of Italian bees came the endemic disease of Italy, and this started an epidemic among the non-immune blacks. Naturally the trouble would become modified when Italian blood was substituted for the black strain, although both races would suffer severely from *B. larvæ*.

The literature of bee-keeping in England leads me to suppose that foul brood has long been present in this country, although overlooked by the early writers. With the introduction of the frame hive it was found to be far more common than was suspected. The explanation is that, in the old days, only the epidemics were recorded. When movable combs became general the endemic cases were also included. The "black" bee of England is now a mongrel, and the varying accounts of the disease on this side are probably due to the variable resistance of the bees, and to the fact that the term "foul

brood" is applied indiscriminately to all varieties and mixtures of foul-brood trouble.

At a meeting of bee-keepers, some of the audience were much amused when I stated that, in the struggle with disease, it was advisable to procure queens from districts where disease was known to exist. Many bee-keepers are obsessed with the idea that, if we could but find some island, some district, where bees are plentiful and foul brood unknown, it would be a grand thing to import stocks and queens from such a source. There is no fact in our experience of disease which warrants such a conclusion. Dr. Dzierzon's loss of 500 colonies, and Della Rocca's description of the introduction of foul brood into the island of Syra, will illustrate the terrible mortality which results from a first epidemic; and it can make no difference whether we take the disease to the bees or bring the bees to the disease.

Mr. Beuhne, the Government Inspector for Victoria, Australia, informed me that the same fallacy prevails there. When paralysis was sweeping through the colony he advertised for queens from an apiary where paralysis had run its course. He hoped by this means to confer some measure of immunity on his own bees; but the advertisement was considered a joke, and no queens were forthcoming.

I think this question of relative susceptibility can be well illustrated by some facts relating to human disease. The Anglo-Saxon has been exposed to consumption from time immemorial. It is estimated that in England 80 per cent of those attacked recover from the disease. In the cases which terminate fatally, often many years elapse before it incapacitates. The aborigines of America, Australia, Africa, etc., broken up into hostile tribes, by this means preserved a strict quarantine against the spread of such a disease. When communicated to any of them it often takes the form of an illness which terminates fatally in three weeks. In the search for immune individuals, are we not more likely to find them among the healthy inhabitants of a crowded city than among these hitherto unvisited colored races?

Again, there are districts in India where 100 per cent of the school children have the malarial parasite in the blood. The relative immunity to malaria of a native of such a district and of an Anglo-Saxon would not be difficult to gauge. The native would suffer no inconvenience. The white man would be kept alive only by regular dosing with quinine. So it is with bees and their diseases. The most susceptible bees will come from districts that have never experienced trouble of the kind under consideration.

Although I have suggested that the Italian bee may owe its exemption from disease to inherent powers of resistance, there is another way in which they may have the advantage. Black bees which have struggled for generations in cold northern climates against long winters and unfavorable

summers have often been put to queer shifts in order to survive at all. As a consequence they readily resort to the fluids excreted by aphides, to damaged fruits, etc. These unwholesome substances may either set up active gastric trouble or cause such a lowering of vitality that an organism hitherto quiescent is able to commence active interference with the life activities of the bee. The freedom from disease shown by the Italian bee, therefore, may be partly the result of cleaner living, as they are far less inclined to gather these noxious honey-substitutes.

The theoretical parts of the foregoing are put forward as an explanation of the facts as they are at present recorded. I quite realize that, with increase of knowledge, the theory may require considerable modification. To the primitive astronomers the theory that the earth was fixed and the sun moved sufficed as an explanation. With increase of knowledge we hear of a fixed sun and a moving earth. At the present time it is postulated that both the sun and the earth are moving. In our knowledge of bee diseases I fear we are only at the fixed-earth stage.

Albury, Herts., England.

---

### SELLING HONEY AT HOME.

Better Prices Secured than by Shipping to the Cities.

BY C. W. PHELPS.

Of late a good many are recommending the sale of honey at home, and this I am glad to see, for I believe in developing the home market. In 1879 I commenced keeping bees in the country, and I had hard work selling the few pounds of honey that resulted from my efforts the first season. I soon had one hundred colonies, and in 1882 or '3 I sold 1650 lbs. of honey to eight families—poor people at that.

After this I began putting up my honey in butter-firkins and selling it for \$12.00 a firkin, which consisted of 150 lbs., or 8 cents a pound. For what I sent to the city at the same time I received only 7 cents, and I had to pay all expenses myself. Furthermore, the honey had to be very light and of good quality, while that which I sold at home was off grade or dark. If I remember correctly I received 10 cents a pound for the small lots sold at home at that time.

Remember, all this was in the country. The way I sold the honey was to prove that it was the cheapest of any thing my customers could buy of like nature. I generally took my pay in any thing the customer had to sell that I would have to buy any way. For instance, of one man I took lumber for hives; of others, meat, butter, potatoes, etc. Of course, I also took pay in money as well.

At the present time we have a different market, for we sell in a small city. We put up the honey mostly in dollar packages, eleven pounds for one dollar. We make a reduction of a few cents for 60-lb. cans.

We always sell our honey as fast as we extract it, and in this way we have no candying, no melting, and no bother. We tell our customers if they want *our* honey they will have to take it when we are ready to sell it, and they know that *our* honey is pure. We are now booking orders for next year, and we could sell a number of tons more if our bees produced it.

We have a friend near us who deals in honey, usually at the same prices. He says he can not sell honey until fall, and he commences to sell about the time we leave off. We send him what trade we can after our honey is sold. We sell much more than he does, although we tell people his honey is as good as ours. The difference is, we have bees, and produce all our own honey, so that people know what we are talking about.

If bee-keepers would follow a few simple rules, honey markets would never be overstocked.

Give good weight.

If you have poor honey, say so; never lie about your own goods nor about your neighbor's.

Explain that your honey is pure, but never joke about it. Do not argue about other honey, and never run it down.

Never sell one pound of honey to a customer who is able to buy more.

Binghamton, N. Y.

---

### CAN SOUR AND SWEET HONEY EXIST TOGETHER IN THE SAME CAN?

BY STEPHEN ANTHONY.

On page 479, Aug. 1, Mr. Holtermann, in substance, asks the above question. Some years ago I was asked to set aside fifty pounds of liquid honey for a party who would call for it later. I used a kerosene-tin, covered only with a cloth, as the top had been cut out, and added small amounts of honey to the can from time to time until the right amount was reached, and after that it stood for about six months. When I removed the cloth I found about a cupful of sour liquid honey on top in a sort of hollow in the candied honey. This I poured off and scraped the rest clean, the cup-like hollow especially, as a portion of the honey near it was quite soft. I found that the remainder was excellent.

A lady who seems to be pretty good at raising sour honey once gave me about 25 or 30 pounds of it which she had been keeping, thinking it might improve in the two years that had elapsed. Upon digging out the honey with a spoon to put it into the vinegar-cask I came upon some very clear amber honey that was still liquid and perfectly sweet. This I strained in order to get all of the sour honey out of it, and filled three quart jars. In these jars this honey has been standing for several months, and it continues to be perfectly sweet and entirely liquid.

Waitete, Amodeo Bay, Auckland, N. Z.



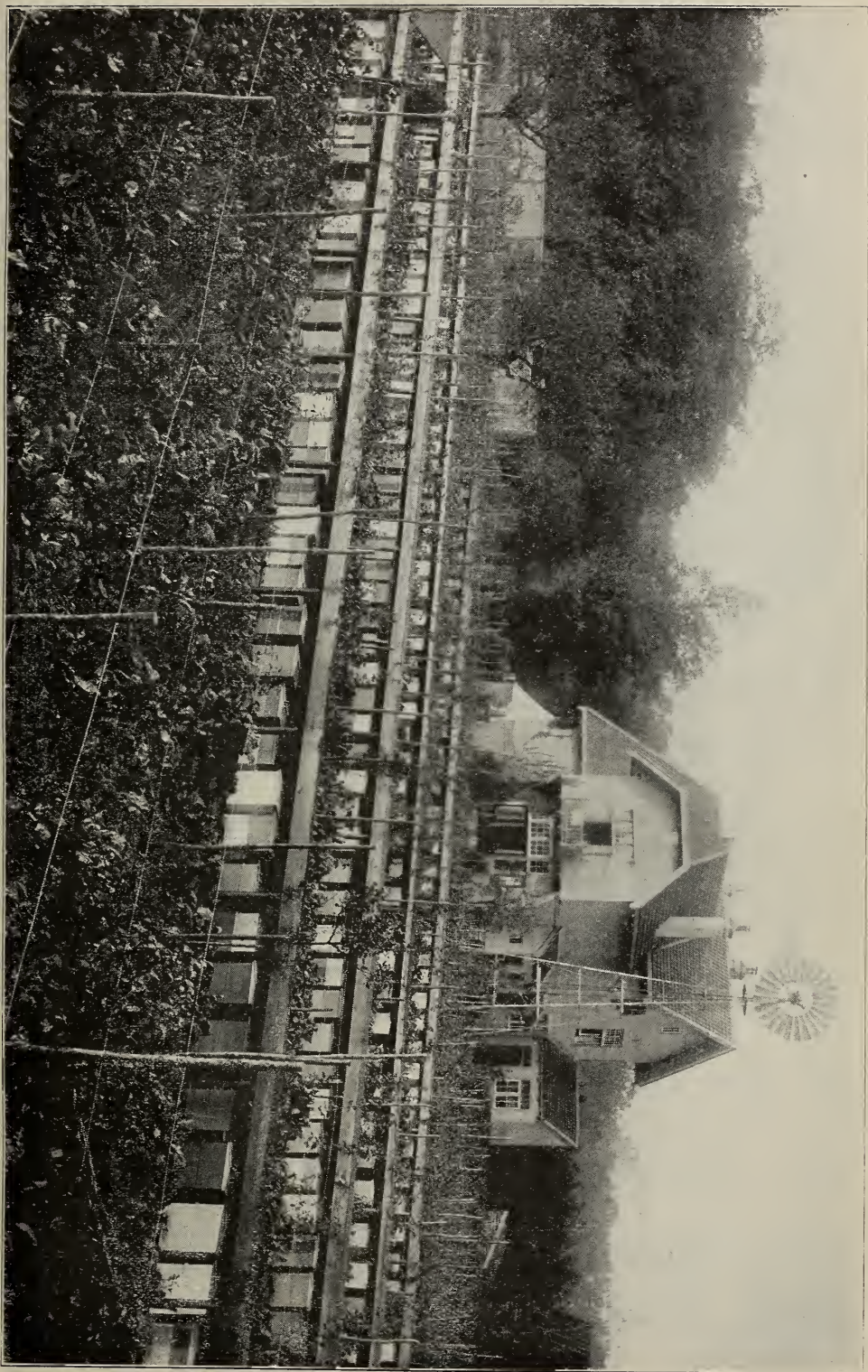


FIG. 1.—HOME APIARY OF HANS MATTHIES, IN BREUKELEIEN, HOLLAND.





FIG. 2.—MIGRATORY BEE-KEEPING IN HOLLAND.

The bees are sent by rail to the station nearest the buckwheat-fields, and then transported to the desired location by rail.

## MIGRATORY BEE-KEEPING IN HOLLAND.

BY HANS MATTHES.

In the Oct. 1st issue, 1908, was an illustrated article showing my apiary, and I now take pleasure in submitting some new views which will, perhaps, be of interest. Fig. 1 is a portion of my home apiary, the hives being sheltered in the winter time by the low roofs. My dwellinghouse appears back of the bees.

Fig. 2 shows the colonies being unloaded from the cars to be transported to the buckwheat-fields, as was mentioned in the above-named article. Early in the season I go with my bees to the cabbage, mustard, and white-clover fields, transporting the whole outfit in a launch. The distance to the buckwheat-fields being rather considerable, I have to use the railroad, which brings the bees to the nearest station, and then they are brought to the fields by wagon.

I am also sending a view showing the interior of my house, which may, perhaps, be interesting, because at the table a box of my honey appears ready for the cakes.

Breukelen, Nederland.

[We are glad to present this brief though interesting communication, for it shows that our Dutch friends can probably teach us a number of things in regard to migratory bee-keeping. We should be glad to have further particulars, especially in regard to the details of moving to the cabbage and mustard regions by launch.—ED.]

## EXTRACTING HONEY AS SOON AS THE COMBS ARE REMOVED FROM THE HIVES.

Honey which Stands in Dark Combs Away from the Bees Becomes Injured in Flavor; the Gravity Strainer Criticised.

BY GEO. SHIBER.

If black or dark brood-combs are uncapped quite deeply, so that some of the black cells are cut off with the cappings and a few of such cappings put into a bottle of fine clover honey, and allowed to remain for 24 hours, the delicate clover flavor of the honey will be gone, and in its place a rank dirty flavor left. It is not necessary to have more than a very small amount of the cappings in proportion to the honey.

This unmistakably dirty flavor may be noticed in honey that is set away for a day and a night in the honey-house in dark combs. A few years ago I had my extracting all finished with the exception of ten or twelve stories, and for some reason or other I was unable to extract these for several days. If I had known then what I have learned since, I would have placed these stories back on the hives again. Well, when we did extract the honey, about three days later, the flavor was simply awful although the body and color were all right. For this reason Mrs. Shiber and myself (and she is more strenuous than I, if any thing) have laid down this rule: After combs are removed from the bees in the yard the honey



must be extracted, and placed in the cans, with the capsscrewed on tight, in the shortest possible time. With this process, and with sealed combs in the first place, we get "quality honey" every time.

From the above it will be seen that I do not favor allowing bits of black comb to float on top of the honey in a settling-tank. In other words, we want to get the honey away from the black comb or any part of the comb at once, as our experience shows that it is safe to allow good honey to be in contact with black combs only when such combs are covered with bees in the hives.

#### THE GRAVITY STRAINER TRIED.

We tried the float plan of separating the honey as described by Mr. Townsend in the *Bee-keepers' Review* and also in GLEANINGS, page 402, July 1. I made the wooden disc of  $\frac{1}{2}$ -inch stuff, about  $\frac{1}{2}$  inch smaller in diameter than my forty-gallon tank, and drove staples around the edge of the float to equalize the space between it and the inside of the tank. I started the "ball rolling" one afternoon, and soon had the tank full, when I had to stop. After drawing out a pailful or so of honey, and pouring it back on top, so as to remove the sediment still remaining in the bottom from the first honey poured in, according to Mr. Townsend's instructions, we then put the rest in cans until there was only about a foot left in the tank. We did not dare draw off any more. The next day we commenced extracting again, and I did not want to draw off that foot of honey and then pour it back in again; but I did, and

kept it out until I washed and dried the tank, then I rigged up our old strainer.

The strainer that we use is an improvement on an old idea. The whole plan, as we used it this year with so much success, is one that has lain dormant in my mind for perhaps twelve years, it being described in GLEANINGS long ago by the late John H. Martin, otherwise known as "The Rambler."

Over the top of my tank I place a sheet of wire cloth, same as that used on windows, and tie it tightly around the top with strong cord, at the same time pressing it down in the middle. Over this I put one end of a five-yard length of white cheese-cloth, the part not in use rolled up at the side of the tank. Warm honey will go through this rapidly when the cloth is clean, but, of course, it soon gets clogged. Just as soon as this happens we pull the cloth along, bringing a new clean surface over the tank, and then roll up the clogged portion on the



FIG. 3.—A DUTCH DINNER-TABLE, SHOWING THAT HONEY APPEARS ON THE "REGULAR BILL OF FARE,"



other side of the tank. When one five-yard piece is used up we put another one in its place. We never bother with the old cloth again, nor try to clean it for further straining—we use a new piece instead. What is the use of wasting five dollars' worth of time to save twenty-five or thirty cents' worth of cheesecloth? The cloth that has been used once, we simply put in water to soak; and when it is washed and dried we cut it up for use in the house for wiping dishes, etc. With us time is a big factor in extracting. We aim to leave the honey with the bees until the last possible moment; and then on, until the last of it is extracted, we do very rapid work, making no false motions to hinder our progress. Buckwheat is always due August 5, so we have to keep out of the way of it.

**BUCKWHEAT BEING SOWN MORE EXTENSIVELY EACH YEAR.**

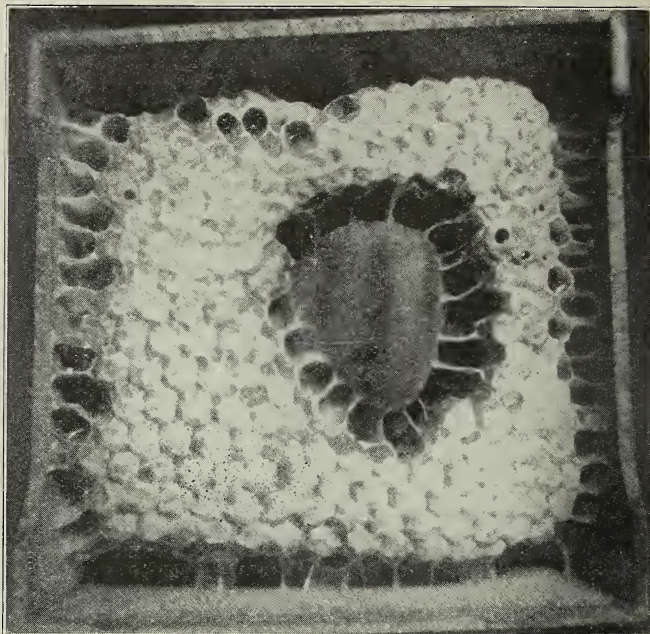
Buckwheat is being planted here more and more, and probably this is true in most dairy regions, as the great question with a dairyman is what feed gives the most pounds of milk "at the condensory?" I was talking with a farmer who had a ten-acre field of buckwheat across the valley, and he said, "Last year I made a fool of myself by selling my buckwheat for \$1.20, and then turning around and paying \$1.50 for feed. I should have had the buckwheat ground with corn or oats, and saved the 30 cents per hundred." Many dairymen are thinking the same, and on this account more buckwheat is being sown each year, but the increase will go to increase the dairy products instead of being made into buckwheat flour for "flapjacks." However, the blossoms are what the bee-keeper is after any way, and so the dairyman and bee-keeper will fill the land with milk and honey.

Randolph, N. Y.

## WASPS BUILD CELLS IN A SECTION OF HONEY.

BY S. N. HATHAWAY.

Last season I found a curiosity in the shape of four cells built by wasps in a section of honey. The illustration shows this quite plainly. This section was a middle



A CASE WHERE BIRDS NOT OF A FEATHER FLOCKED TOGETHER.

one in the front row, and this is the only reason I can think of why the bees let the intruder enter the hive so many times; for, besides building the four cells, which in itself would necessitate many trips, the cells had to be filled with tree-spiders as food for the young wasps in the larval stage.

**A HANDFUL OF BEES THAT DEVELOPED INTO A NORMAL COLONY.**

The question has often been asked, "Do bees carry eggs?" Those who doubt this would have some difficulty in solving the following: My neighbor has two hives full of combs—one of the two containing a little honey and a handful of bees. These few bees remained in this condition a month or more, when, as there were no more bees to put into the hive, the entrance was closed. Early in October my neighbor looked into the hive, and to his surprise found the bees still alive, with a fine yellow queen. There were also young bees, some sealed brood nearly ready to hatch, and quite a space of comb filled with eggs.

Waldron, Ill.

[We assume from what you say that neither of the two hives contained a full colony of bees, and neither one a queen, when the first examination was made, although the one mentioned had a little honey and a "handful" of bees. While we believe that bees under some circumstances may steal eggs, still this case that you cite is not conclusive proof. We regard it as probable that a swarm from some other apiary, or perhaps even from a bee-tree, might have taken possession of this hive shortly before



the entrance was closed; or it looks to us as though there was some opening in this hive even after the entrance was closed, so that the swarm might have come afterward. You do not say how long it was before October that the entrance had been closed. If a month or more we should hardly expect that the colony would be in a normal condition if there were absolutely no opening from which the bees might fly, for the larger number of bees would certainly starve. It looks very much as though there were some entrance through which bees could pass; and if this was the case it seems quite clear to us that a swarm unbeknown to your neighbor selected this hive and took possession. We do not know just how many bees there were originally, for a "handful" is rather indefinite. However, even if a queen had been reared it is doubtful if she could have built up a normal colony with so small a start.—Ed.]

#### HOW APPEARANCES AFFECT SALES.

An Insight into the Deceptions Practiced by some of the Bottlers of Food Products; what is the Best Shape and Size for a Honey-jar?

BY WESLEY FOSTER.

The appearance of food products has more to do with their sale now than ever before since stock packages have so largely taken the place of the bulk products. This has been brought about by a number of reasons, among them being that the manufacturer wishes to derive some advertising through the sale of his goods. For instance, if he put out rolled oats in barrels, no one but the wholesaler, or perhaps the retailer, would know who the manufacturer was; hence the neatly labeled package, which not only advertises the particular brand, but is a better protection for the goods, keeping them free from dust, and saving the retailer the trouble of weighing out the packages, the weight being guaranteed by the manufacturer.

This stock-package business has spread until it takes in almost every kind of food; but with it has come the chance for deception. Perhaps one manufacturer puts out a gallon can of peaches. A dozen others soon do likewise, and competition becomes so strong that some sharp canner gets up a can holding  $3\frac{1}{2}$  quarts. This looks as large as the

gallon can; and unless a close comparison is made the difference does not appear. Any way, even if the grocer does notice the difference the customer is not likely to; so that this particular canner has the advantage, for he can put out the smaller can perhaps 50 cts. a case cheaper, so that his sales are larger and larger. Thus this thing has gone on until we have gallon cans holding only three quarts, and so-called quart cans holding a little more than a pint. There is the greatest anxiety on the part of all canners and preserve concerns to put out a package that will look the largest and hold the least. If any one wishes to go into this matter more in detail, let him procure a bottle catalog from some glass company and note the hundreds of different styles and shapes; or one can get almost as good an idea by looking over the shelves of the nearest grocery store.

There are several ways of making a jar hold less than it appears to hold, or, in other words, of making it appear to hold more than it does. Perhaps the trick originated by brewers in having beer-bottles made with the bottom blown an inch or more up into the body of the bottle in a bulb of very thick glass. This alone takes out about one-third of the real capacity of the bottle. Another scheme that works well so far as fooling the customer is concerned is to use very thick glass. The long-necked jar should also be mentioned, the neck being covered with a paper label; and if the neck is almost as large as the body of the jar the delusion is all the greater. Moreover, this gives space for the label without covering up any of the goods in the main part of the container.

A pint jar having a small base, which gets larger toward the top and then draws in abruptly at the neck will have the appearance of holding as much as a quart jar if the latter is short and stubby. This large appearance of a bulb-shaped jar is well



HOW DIFFERENT-SHAPED JARS ARE DECEIVING AS TO THE AMOUNT THEY HOLD.

No. 1 holds one quart of honey; No. 2, one pint; No. 3, seven to eight ounces; No. 4, one pound; No. 5, seven to eight ounces; No. 6, quart measure.

known to food manufacturers, and it is really an attractive jar that sells well. In the same way the 4x5 section of honey looks larger than a 4x4 square section, and therefore the tall section, like the tall jar, is the better seller than the smaller-appearing square one. I myself have been fooled into thinking that a pint jar held a quart because the pint jar was thin and tall, and had a neck that took the tall cap. When we consider the thick glass, the bulb-shaped, tall, large-necked jars with large capacious caps to hold air, it is really wonderful how small a quantity we can be satisfied with for 25 cents.

To overcome these matters some States (Nebraska, for instance) have passed laws requiring the actual net weight placed on every label of a food package. The time is coming when there will be a change in the matter, for people are now ceasing to be fooled by mere appearance. The looks as a sole criterion have failed to make a permanent impression; and the simple straight jars with plain caps are cheaper, and the jars more serviceable when empty; and so, while I have decided opinions as to the necessity of providing the most attractive packages for our honey, I do not think we need to resort to air-packed necks and caps, nor to glass bubbles in the bottoms of our jars.

All this reminds me of the way assessments are made on property for taxation. The assessing has kept falling from real value until we have it down to about one-fourth of the full value, and, of course, the mill tax goes up with each drop in the rate of assessment. In the same way we get packages that appear large for the price, or perhaps for a little less than the price of the original standard-sized packages. Now, would it not be well to have a general readjustment all around and put things absolutely on the square and open basis? If a jar holds a pint, let it be labeled in that way, or perhaps the weight-mark would be better. So many goods are sold by the can that no one knows how much he is really getting.

To illustrate the points I have referred to, I have made a photograph of several different glass packages, most of which have been used for honey. No. 1 is a quart Mason jar and No. 6 a quart measure. The quart measure being short, and made of thin tin, does not appear as large as the Mason jar. The size of the package is easily seen to be less apparent when the dimensions run horizontally than when the change is on a perpendicular line. Of course the cap on the Mason jar, and the fact that the glass is thicker than the tin, makes the quart jar larger than the quart measure, though it holds no more. Now, does not jar No. 2, which holds a pint, look more than half as large as No. 1? This shows that the smaller packages look larger when on the shelf than the larger packages do in comparison with their real capacity. I believe that this is one of the reasons for the gradual reducing of the size of packages for food

products. A pint jar at 25 cts. will sell much quicker than a quart jar at 40 cts., and I do not think the smaller amount of money required is the real reason for its greater sale, although, of course, it is a big factor.

Now, take jar No. 7—the small black one toward the left of the picture, which holds just one-fourth of a pint. One would hardly suppose that it would require four No. 7's to fill one of the No. 2's. The thick glass, and the fact that the jar is tall, are the principal reasons why No. 7 looks large. This is a jar that sells for ten cents, generally, when filled with honey. It is a rapid seller, too, for it holds enough honey for the average family at one meal—provided the average family does not have too many children who are inordinately fond of honey. No. 7 holds almost one-half less than No. 5, which holds just the same amount as No. 3. By the way, this No. 3 shows the effect produced by thick glass and the bulb-shaped bottle with a rather tall neck. It is one of the most attractive jars for honey that I have seen, even if it does hold only seven or eight ounces of honey. There is room on the neck for a label which will cover up the empty space in this part of the bottle. Of course, the neck might be filled with honey; but what would be the use of doing so if the jar sells just as well with the ounce and a half of honey left out?

No. 4 is perhaps the most deceiving of all in regard to the amount of honey or other material which it will hold. This bottle had sweet pickles in it up to the bottom of the gilt label around the neck, the label being wide to cover the tall neck. The jar holds one pound of honey or just two-thirds of the amount that could be placed in No. 2. Jars No. 3, 4, and 7 are the most attractive on the shelves; and with the net weight plainly marked on the label there would be no deception.

Perhaps this packing of food in expensive glass bottles that are useless when empty, and that are deceptive in the amount that they hold, is in part responsible for the high cost of living. The consumer pays 30 cts. a pound for honey in No. 7; and the bee-keeper who furnished the honey in 60-lb. cans received not over 8 cts., and possibly not over 6. I may be wrong in some of my conclusions, but not so very far off when taking my position as a whole.

Boulder, Colo.

[From what you say we believe that you would regard it as ideal if all glass packages could be plain and similar in shape; but as long as this (at present) seems impracticable, you would adopt the most attractive and economical shape for all glass honey-containers, but state plainly on the label the real amount contained.]

We believe that you are very nearly correct in your statement as to the high cost of living. There is certainly a vast difference between the amount that the producer receives and the amount that the consumer pays for a food. The middlemen may not



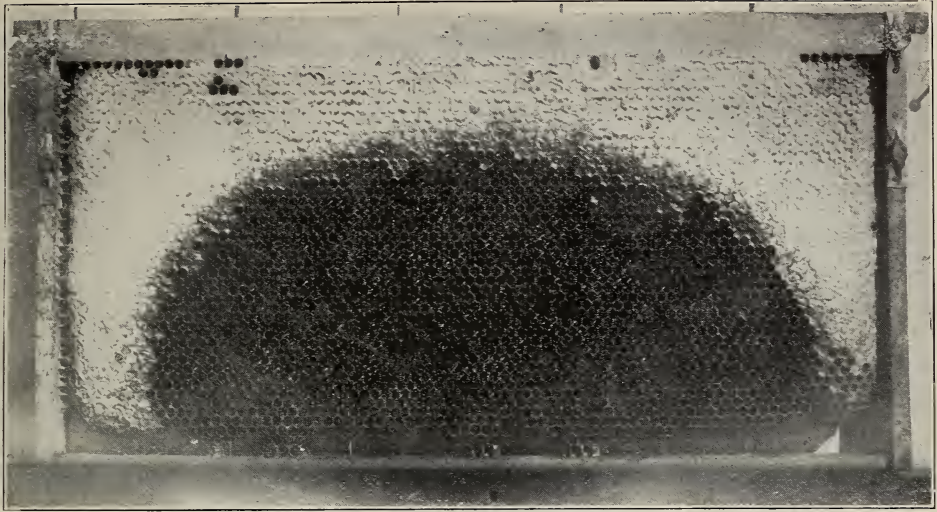


FIG. 1.—AN IDEAL COMB TO FORM A WINTER NEST.

be getting rich; but if they are not, it is because there are so many of them. Certain it is that we all demand expensive containers, not only for our honey, but for most of our different kinds of food. Recognizing this, bee-keepers and honey-dealers can well afford to select attractive containers, thus furnishing what is demanded, but taking care, always, to practice no deception, for deception sooner or later kills sales.—ED.]

### THE WINTER NEST OF A COLONY.

How the Bees will Form it if Not Disturbed by their Owner.

BY E. R. ROOT.

A year ago, it will be remembered, there was some discussion as to whether bees actually form a winter nest. Our good friend, the editor of the *Canadian Bee Journal*, while not doubting the existence of such a nest, yet like the Missourian of old wished to be "shown." After we had presented our proofs our contemporary very generously acknowledged that he was "almost convinced."

What do we mean by "winter nests"? We mean a space of empty brood-cells in one or more combs, such space approximating the form of a hemisphere in ordinary Langstroth brood-nests. These empty cells surrounded by sealed stores constitute the winter nest where the bees cluster when conditions are ideal. As the stores are consumed, the number of empty cells increases either backward or forward, but always upward. As a general thing we find the ball of bees located near the front of the hive and regularly over the entrance. As the stores are consumed they move upward and backward; but the cluster in no case extends

over the sealed honey when the bees can have their own sweet will.

Very often a well-meaning A B C scholar finds three or four combs in the center of the hive, having a space of empty cells as large as the hand spread out. He thinks this is all wrong and will remove the combs containing such spaces, and put in their place *solid cards of honey*. What has he done? He has compelled the bees to cluster upon sealed honey. The cluster is broken up into slabs approximately  $\frac{3}{8}$  inch thick, each slab of bees separated by approximately an inch of solid honey. Instead of having one solid cluster separated by only the midrib of the combs, he has made a series of clusters, each within itself trying to maintain its own body heat but at a very great disadvantage.

Let us illustrate: Two people on a cold winter's night require less bed clothing than one person would in that same bed. Now, then, suppose that, instead of having those two bed-fellows separated from each other by only their night clothing, we have a slab of metal or even wood between them. If they are compelled to place their warm bodies in contact with that cold surface they lose a great deal of their body heat because the cold surfaces carry away (that is, dissipate) the warmth.

We have exactly that condition when we insert combs of sealed honey into a bunch of bees. We compel them to divide up into four or five clusters. The result is, that colonies tampered with in this manner perish or come out in the spring very weak because of their inability to maintain the requisite temperature. Where outside bees become stiff with cold they can not long endure that condition.

We show herewith two illustrations of combs showing an ideal winter nest which bees under normal conditions will form if

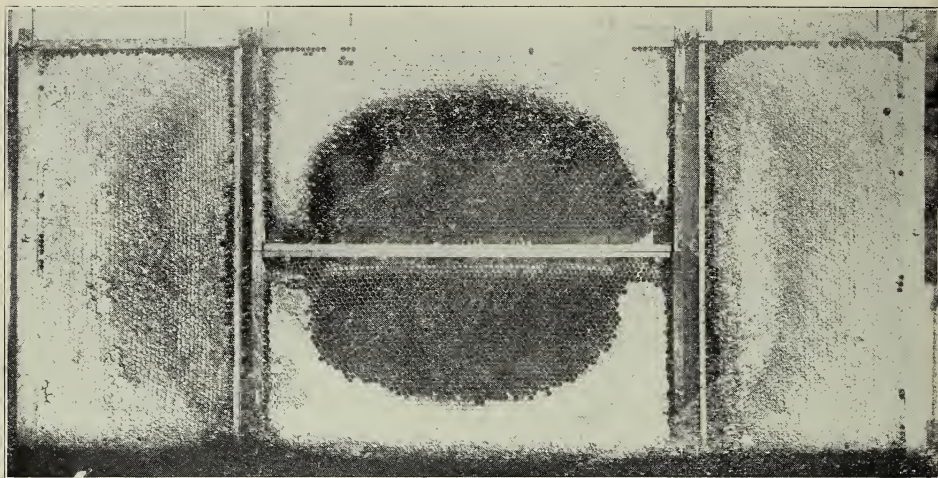


FIG. 2.—COMBS FOR MAKING UP A WINTER-NEST FOR A MODERATE-SIZED COLONY.  
Note the center comb is placed upside down.

allowed to carry out their own sweet will without molestation from their well-meaning owner. In Fig. 1 note the hemispherical shape of the winter nest as the bees form it under ideal conditions. The combs next opposite in the brood-nest will show a smaller half-circle, and those next to them a relatively smaller circle still, until there is just a mere spot of perhaps an inch or two in diameter in the outer comb. This makes up a complete hemisphere in the Langstroth brood-nest or a perfect sphere in a cubical brood-nest. While one does not by any means always find this form of winter nest it is the ideal condition.

If one lifts off the cover of a colony when the temperature is about 45 outside he ought to find, if conditions have been favorable, the cluster of bees in a space about the shape shown in the winter nest of the frames here shown. On the next two combs the half-circle of bees will be smaller until there will be a little patch of bees on the outermost combs or comb. As it becomes colder this hemisphere of bees shrinks in size. When the temperature goes down below zero a large strong colony will be compressed into a space about equal to that of the doubled-up fist. It may not then occupy more than two combs.

In Fig. 2 we show two combs having an ideal winter nest already formed. For a moderate-sized colony this will make a good winter nest. We would then place on the outside two solid cards of honey, as shown in the two end frames. Colonies not over strong we would contract down to the space they will occupy in mild weather by putting in thick division-boards, or packing of some sort to fill up the empty space. If, on the other hand, the colony is a strong one it may require three or four and possibly five combs in which there are winter-nest cells.

If a colony is fed gradually during October and November they will form this win-

ter nest. If, however, they are on the verge of starvation, and they are fed 30 lbs. in a single night toward the last end of the fall, or when it is quite cold, they do not have the opportunity of forming this nest. They will carry the syrup down while it is hot; then for a few days after that, if it is so they can fly, or, rather, so the cluster can move freely about the brood-nest, they may or may not rearrange the stores. The cluster, when it actually forms up for winter, will be practically one homogeneous mass of bees separated by only thin cell walls and the midribs of the combs.

If anybody doubts that bees try to have a winter nest, let him break into several clusters of bees when the temperature is down to about 5 above zero, in an outdoor colony. We have done this repeatedly. If the arrangement of combs has not been disturbed in the fall, we will probably find the bees tightly jammed into the cells. And, again, we will often discover, as we go over our colonies in the late winter or early spring, that some of them have actually starved to death. In all such cases we will see dead bees tightly packed in the cells of the winter nest, and a solid mass of bees between the several spaces between the combs. Starvation is often due to the fact that cold weather has continued so long without a let-up that the bees are left high and dry, so to speak, in the center of the winter nest. They actually starve, notwithstanding that sealed honey is within two inches of the cluster. The long-continued cold has given them no opportunity to warm up and shift the cluster over in contact with the sealed honey. We have seen this condition almost every winter in our yard.

Still again, we have often found dead colonies where some of our newer men in the bee-yard had disturbed the combs, putting a solid comb of honey right down through the center of the winter nest. This made



two bunches of bees; and both, being too small, died.

When it comes to indoor wintering, especially where the cellar temperature does not go below 45 F., a winter nest is not so vitally necessary. But if the temperature goes down below 45, then the absence of a winter nest may mean the death of a colony.

Nature has worked out this problem of wintering bees; and when we tamper with her plans we tamper with our pocketbook. While we can do certain things contrary to nature, we can not interfere with her plan in the arrangement of the combs.

### BEE-KEEPING AS A HOBBY.

An Explanation of the Various Parts of a Hive for the Benefit of the Beginner.

BY F. DUNDAS TODD.

The beginner in bee-keeping ought at the very start to get acquainted with the parts of a hive. If he be like the writer at the outset of his bee-keeping career the novice may assume that the structure in which the bees are housed is a solid piece of carpentry; but he will be greatly mistaken, for it consists of about a dozen movable pieces, which number is greatly increased in the active months of the year—June, July, and August.

#### THE LANGSTROTH HIVE.

We will, therefore, begin by studying a hive as it appears on the stand. Fig. 1 may be taken as a type of the average hive in common use in this country to-day, though there are, of course, other styles; but the bee-keeping world as a whole has settled down to using what is known as a Langstroth hive, though generally called the

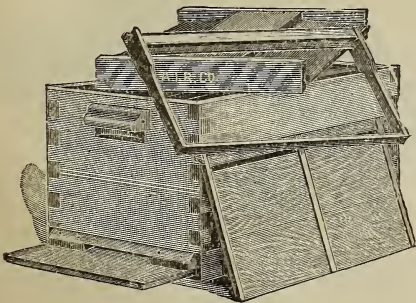
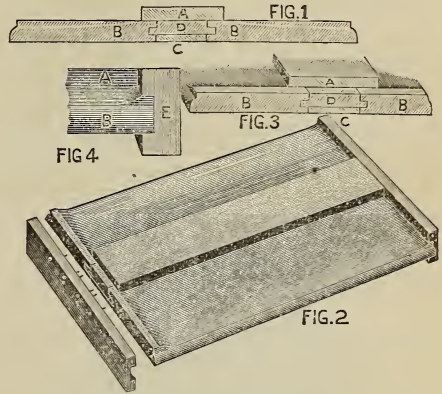


FIG. 1.

Dovetailed in catalogs. Now, if we look at it even casually we see that, like a dwelling-house, it has a roof, side walls, and a foundation. These three are definite, distinct parts, and are essential features of every modern hive. If you take hold of the roof you will find it to be removable, sometimes with a little difficulty, for the bees have a habit of fastening the roof to the walls with a special kind of glue that is very adhesive. In bee-keepers' language

the roof of the bee-house is known as the "cover."

The four perpendicular walls inclose the living-room of the hive, which is also at once pantry, kitchen, dining-room, bedroom, and nursery; for a wonderful series of operations is going on in this little home all at one time. But the modern bee-keeper, although he knows full well the many phases of its interesting life, has come to associate it with the raising of the family, so he usually speaks of it as the "brood-chamber." It is also known as the "hive-body."



The foundation of the bee-house has side walls like the cellar of a modern human home; but since there is no floor between the basement and the living-room we can not give it a title corresponding to the same part of our home. Bee-keepers in their practical way have given the name of "bottom-board" to this very important part of a hive.

You have been told that, in order to prevent all decay of the bottom-board, it must not rest on the ground, but upon wood, brick, or stone, at a convenient height from the earth. This support is called the hive-stand.

#### THE COVER.

We will now examine the different parts of a hive in closer detail, as, like every thing else, there are important problems to be solved in their construction. Take the cover for example. At first thought one would suppose any flat piece of good lumber would do very well; but any bee-keeper will tell you that very much thinking has been put into designing hive-covers; nevertheless, the perfect cover has not yet been invented. In the first place, it must be water-tight, for rain must not get into the brood-chamber. Then it must fit snugly on the body of the hive so as to conserve the heat there, and, consequently, must be prevented from warping.

The illustrations, Figs. 1, 2, 3, 4, show a design that is very efficient. The pieces are securely fastened by tongue and groove, the joints being protected from water by a cap. Warping is prevented by cross-pieces on the ends.

## BROOD-CHAMBER.

The brood-chamber is really a box without top or bottom. Its mission is to hold the frames to which are attached the combs in which the bees store the honey and pollen, and also raise the young. Some are wide enough to hold only eight of these frames; but an increasing number of beekeepers prefer them wide enough to hold ten frames. This size is shown in Fig. 5, nine of the frames being in place and one outside.

Simple as is the general plan of a brood-chamber, it must nevertheless be made with great accuracy. You see, after bees had been kept by man for several thousand years a clever bee-keeper discovered one very important fact—namely, their conduct in small areas varied according to the size of the space. When this is less than one-fourth of an inch the bees will fill it with wax or other adhesive substances; if more than three-eighths of an inch they will build

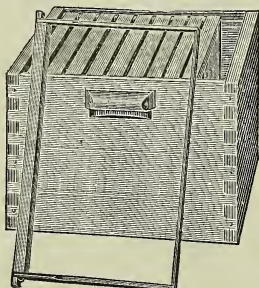


FIG. 5.

comb in it. When he learned this he was able to invent the movable frame whose most noteworthy feature is this: Its end-bars are about three-eighths of an inch clear from the inside ends of the chamber in which the frames hang, thus allowing the bees room to move freely around the ends, but preventing the building of combs that would fasten the end-bars tight to the hive-body. It will also be apparent that the sides must be perfectly square with the ends. Hive-bodies, then, must be machine-made; and it is better if they have lock joints as in the illustration, for such joints insure perfect squareness.

## BOTTOM-BOARD.

The bottom-board is really the floor of the hive which rests evenly on three sides of it. The fourth side is left clear, thus providing an entrance to the house, so to speak; but the doorway is also a ventilator, and it is important to remember this fact, for bees breathe and need fresh air just like any other animal. So we must intelligently follow the climatic conditions and adjust the size of the entrance to suit the comfort of the bees, contracting it as winter approaches, and enlarging it in the hot days of summer.

The illustration, Fig. 6, shows an excellent bottom-board of great adaptability. The upper figure is partly sectional, a small

part of the end of the hive being indicated in position to show that the sides of the bottom-board and the hive are of the same length. An alighting-board fits into the groove in front (half of the board is shown

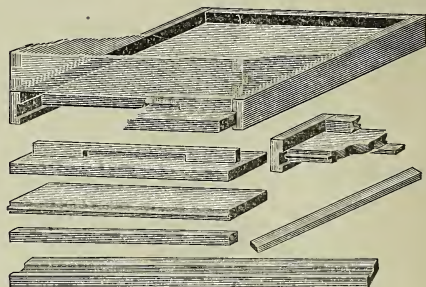


FIG. 6.

in position), and projects several inches in front of the hive-body. One side of the alighting-board is perfectly plain; on the other is nailed a cleat with a narrow passageway. When this side is turned up, the entrance is one-fourth inch by eight inches; but if the plain side be uppermost, then the entrance is seven-eighths of an inch by the width of the hive.

## HIVE-STAND.

The purpose of the hive-stand is to keep the bottom-board clear of the ground, and thus prevent decay. But if the board and the stand have contact over a considerable area it is found that both water and ants will collect between them and hasten the destruction of the wood. The points of contact between the bottom-board and stand should, therefore, be as small as possible. Fig. 7 shows a stand that is inexpensive,

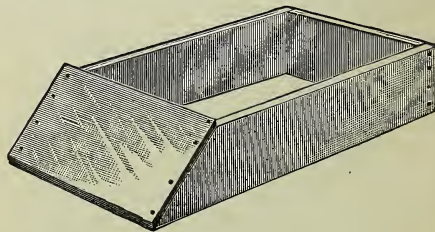


FIG. 7.

easily put together, and strong and durable; at the same time, it touches the bottom-board only around the edges.

## FRAMES.

The furniture of the bee-house is very simple, and rather wanting in variety; but the tenants so far have not been known to make any complaint, so we will gravely assume they are satisfied. They are mostly ladies, seemingly free of the habit (said to be characteristic of their human sisters) of finding fault with their home and its furnishings. Eight frames, sometimes ten, with a division-board or follower, is a complete inventory of the contents of the brood-



chamber. As will be seen from Fig. 8, each frame consists of a top-bar, a bottom-bar, and two end-bars. The top-bar is longer than the bottom one, the projecting lugs being the points of support when the frame

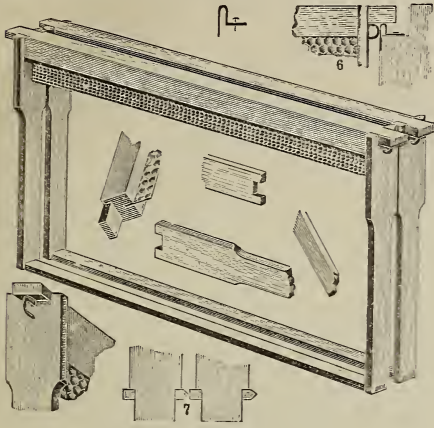


FIG. 8.

is in the hive. Notice the end-bars particularly, for the upper third is wider than the lower part, the respective sizes being  $1\frac{3}{8}$  inch and 1 inch. Careful measurements and experiments have proved that bees build combs in the natural state very nearly one inch and a half from center to center, so man secures the proper distance in the hive by making the end-bars of the frames the proper width. The space between the lower part of two frames is the regular bee-space of three-eighths of an inch, so as to facilitate the movement of the bees from one part of the hive to another.

#### DIVISION-BOARD.

Since there is considerable expansion and contraction in a hive, due to the presence or absence of moisture it would be unwise to make the frames a close fit, so the brood-chamber is somewhat wider than the frames demand. After the frames are all in, the vacant space is partially reduced by the introduction of a division-board, which, being in contact with the last frame, really becomes the wall of the brood-chamber on that side.

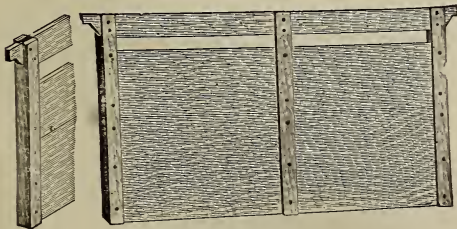


FIG. 9.

Fig. 9 shows one style of division-board or follower.

#### BEE-KEEPING IN CALIFORNIA.

The Sage the Principal Producer in the Southern Part of the State; the Lack of Rain Prevents the Secretion of Nectar in Most Years.

BY P. C. CHADWICK.

*Mr. Root:*—May I add something in line with your comment on the articles of Mr. E. M. Gibson and Mrs. Acklin? After carefully reviewing Mr. Gibson's article and your comments, page 718, Nov. 15, I find myself almost entirely in accord with you, and with him in a few respects.

I am not a "pessimist" who talks about overproduction; but I am of the opinion that production can be reduced by overstocking, much in the same way that a small pasture would fatten four head of stock while ten head would merely keep alive.

My object is not to discourage people from casting their lot with us in this glorious climate, but, rather, to acquaint them with difficulties that must be surmounted, and at the same time give an idea of what those who have been in the bee business for years have accomplished and what they have faced in the way of seasons.

South of the Tehachapi Mountains lies practically the entire sage of our State, notwithstanding eastern people and many of our westerners term every form of small growth on the vast slopes of the Rocky Mountains "sage brush." There is no denying that the button (or black) sage is, of all honey-plants, our chief surplus-producer. Neither does it average a crop more often than every other year regardless of rainfall; for it seems necessary, from its semi-arid nature, to be dried out or rested before it comes back to its prime yielding condition. I have seen it return some surplus for three consecutive seasons; but the middle season was not what could be considered a crop, even after a sufficient rainfall.

I am now speaking of Southern California, the sage-field—not any particular place within that may have special producers, as the orange at Redlands, Riverside, Pomona, Monrovia, the lemon in San Diego Co., etc.—for the portion of our territory covered principally by the sage is so much more vast in extent that the few thousand acres of orange, lemon, or deciduous fruit are a comparatively small factor in a good sage year, and show no great results when the sage fails; therefore if the sage fails every other year, Southern California outside of those districts above mentioned may well be counted an every-other-year producer, which means the greater portion of our Southland.

To quote Mr. Gibson: "There were scores of bee-keepers who did not get a pound of honey, but it was not the fault of the season nor of the bees." The implication follows that it was the fault of the bee-keeper. Now, of the entire article the above sen-

tence is the most unfair; for most of us know that, regardless of the good condition of many well-kept apiaries during the entire season, no surplus was secured. I will admit that, if every one knew the true condition in our sage ranges, and the overstocked condition of the foot-hills on the outskirts of our orange-groves, we would be in no danger of overstocking.

The misapprehension of many people owning bees (not bee-keepers) as to the distance locations should be apart, has much to do with overstocking. My apiary was at one time in as fine a location as could be found; but now, however, I am surrounded by an aggregate of 1200 colonies, any of which can overlap my range on one side or the other, and nearly half on both sides to a certain extent.

Here let me give you the report of our local weather observer on the annual amount of rainfall for 15 years beginning with 1895. Ten inches of rain is about as small an amount as can be figured on to produce a yield from the sage; and that must fall late in the season. For example, we had 10.22 inches this season—only about two inches of which fell after Jan. 1, the result being that, while the sage bloomed more or less profusely, there was not sufficient moisture to produce nectar. In 1895 there was a fall of 7.51 inches; 1896, 12.85; 1897, 5.50; 1898, 4.82; 1899, 6.89; 1900, 12.21; 1901, 7.00; 1902, 12.75; 1903, 15.81; 1904, 8.59; 1905, 22.12; 1906, 16.22; 1907, 20.76; 1908, 14.56; 1909, 14.47; 1910, 10.22.

I have the records before me back to 1880—those from 1880 to 1895 being 4 inches less per annum than the average from 1895 to 1910. In 1882 the fall was only 2.94 inches. Think of going twelve months with less than three inches of rainfall, and three years with less than 15 inches, as was the case from 1880 to 1883.

Bee-keeping here is conducted, to a great extent, in as haphazard a style as farming was in the middle West 30 years ago, when, we are told, the farmer moved the barn instead of the manure. We have bee-keepers who know their business and know it well; then we have a class who give their bees little personal attention, know little of the business, and seem to care less, for they rent their holdings for a share, during the honey season; many renters simply knowing how to extract, and they usually do close work on that, after which the bees are left to shift until another season. Imagine the condition of some such apiaries, the danger of foul brood, and the general run-down and unkept condition.

I could not point you to a single bee-keeper who depends on his bees entirely for his support, though some have been in the business for twenty years.

If the East can send us up-to-date bee-keepers with capital to buy out these half-kept apiaries, and help improve conditions, we will give them the glad hand; but as for new locations, they are few and far between—at least, desirable ones; and what we have

are being encroached upon each year by the barley-fields. More than one who thought himself secure a few years ago now finds he is surrounded by great grain-fields, and will soon have to pull up stakes for new pasture, and eventually only the most rugged of the foot-hills will be left for the support of our industry.

Redlands, Cal.

## A HISTORY OF A CASE OF PROPOLIS POISONING.

BY C. H. HOWARD.

This summer I worked among my bees without a veil, and with my shirt-sleeves rolled above my elbows. The beginning of October the inside part of my arms between the elbow and wrist became very much inflamed, and itched, smarted, and burned all at the same time. Oct. 11 I tried a bismuth formic-iodide preparation, supposing the trouble came from some poisonous plant. I was surprised, as I can handle poison ivy without any ill effect. My arms kept about the same, sometimes a little better, and then not so well, till Oct. 31, on which day I scraped the burr-comb and propolis from some sixty frames. That night my arms got very much worse, and for sixty hours they were very bad. I slept very little for two nights. I showed my arms to a doctor, and he said I had got them poisoned, and gave me stuff to put on.

Oct. 10 I wrote to Washington, D. C., for Farmers' Bulletin No. 86, "Thirty Poisonous Plants of the United States." None describe my case, but ivy is the nearest.

Mr. C. P. Waldron, of Boulder, told me, some time ago, that he had to give up his apiary of over 100 colonies, as working over them brought on vomiting. Mr. J. E. Walcher says he has been poisoned, and he supposes it is from the propolis; and Mr. Eggleston, who helps Mr. Collins with his 900 colonies, says his hands become poisoned soon after he begins work with the bees in the spring, and it continues till some time after he gets through with the work in the fall. Many people have told me of getting poisoned from propolis; but I never believed it until I myself had trouble.

I have kept bees on and off more than fifty years, and I never had such an experience as this year. I had several cases of poisoning after cleaning off the propolis from a few hives. Then on Nov. 29 I did considerable scraping, and my arms were very bad for two days, and did not get well till the 6th or 7th of December. Yesterday, Dec. 9, I thought they were right for an experiment, so I put a little propolis on my left arm, about three inches above the wrist. This was at 12:50 P. M., and I felt nothing of it for several hours. At 7 P. M. the spot was much inflamed, and at 11 P. M. it was very bad. This morning my wrist and five to six inches above it was scarlet, and all the symptoms were as I described.

Boulder, Col., Dec. 10.



## Heads of Grain

from Different Fields

### What Makes the Hives so Damp Inside? the Relative Values of the Different Packings.

I have eight colonies of bees, all in good condition—plenty of bees and good clear honey. They are in eight, and ten frame hives. I have had only two years' experience in the business, and am troubled about their sweating so much, especially the single-walled eight-frame hives. The two chaff hives do not sweat much. They all face southeast; are in a bee-shed open in front with the back to the north-west, and straw between the hives, and the top or super packed with straw. Early last fall I cut linoleum the size of the top of the brood-chamber, and under this I used strips to provide a bee-space on top of the frames. Right under this linoleum is where the sweat starts, and runs down and out at the entrance. Of course the bees get damp, and freeze. The opening to the entrance is  $\frac{3}{8}$  x 9 for the eight-frame,  $\frac{3}{8}$  x 11 for the ten-frame, and  $\frac{3}{8}$  x 8 for the chaff hives, which are also ten-frame. Would you advise cutting a small hole in the top of the linoleum, or take out the block in front and give them the full  $\frac{7}{8}$ -inch entrance?

Last winter I lost an Italian queen from the A. I. Root Co. because the hive was so damp. It was so wet it burst, and the paint came off the sides.

Washington, Pa., Nov. 29. J. C. McNEELY.

[Common straw, unless a great deal of it is used, is hardly dense enough for packing. You had better use planer-shavings, leaves well packed, or wheat chaff if you can get it—a packing that is better than all of them. The trouble is, the sides and tops of your hives are too cold from insufficient packing. Then, moreover, linoleum is not as good as a plain board laid on top. The surface of the linoleum is too cold. On a cold morning, with your bare feet step on a piece of linoleum and then on a thin board and note the difference. Wood is a much better non-conductor of heat and cold.

Your entrances appear to be large enough in size, but possibly for your locality it might be wise to make them larger. Before we would do that, however, we would try the absorbing-cushion plan, because there is a possibility, and even probability, that your locality is so damp that absorbents providing for upward ventilation would be better than a tight sealed cover; but if you use absorbents you will need to have a good deal more packing material than you have provided. It should be of a loose porous nature, preferably chaff; but if this material can not be secured a large quantity of dry forest leaves may be substituted. Planer-shavings do very well, but are not quite the equal of chaff. When you use absorbing cushions you will need to have them not less than eight inches thick. Then be sure to provide an air-space over the packing and under the cover, so that the moisture as it passes through the cushion can escape.

Now, we wish to suggest this: That you try a part of the bees with sealed cover and eight inches of packing material on top, and the other part with absorbing cushions. When you use the latter you will need to put a Hill device or some sort of stay to hold the cushion up off the frames.

The very fact that your chaff hives are drier goes to show that the single-walled hives are not sufficiently protected. By increasing the amount of protection for all the hives you will reduce materially the amount of condensation; but in any case remove the linoleum, using boards instead. We shall be pleased to have you report the result of your experiments next spring.—ED.]

### Lack of Ventilation; Another Instance of the Folly of Shutting the Bees in the Hive with Wire Cloth when Placed in the Cellar.

I am in trouble, and do not know how I am going to get out of it. My bees are kept in an outyard, and in moving them to the cellar I was obliged to screen them in. I am now going to tell you how I proceeded with the screening and moving. I put the hives on a bottom-board 2 in. deep, setting them

even with the front end of the bottom-board, and over this open space of 2 x 14 $\frac{1}{2}$  in. I nailed No. 12 wire cloth. The space at the back end of the bottom-board I closed except a space of about an inch wide and five inches long, over which I also nailed wire cloth. They were then placed in the cellar and left as I have described. The colonies are strong in bees, and have an abundance of clean sealed stores. When first put in they settled down, and I thought they would be all right; but at this writing, Nov. 28, they are perfectly crazy. I should have said I left the cover on. Is it possible to make any change that will quiet them? The cellar is clean and the air is pure, with temperature at 45.

El Roy, Wis.

CHAS. SHELDON.

[We would advise you by all means to remove the wire-cloth screens; at any rate, fix it so that the bees can get out of the hives. They might build out over the fronts of the hives, but they would soon go back. In spite of what you say, we think there is a lack of ventilation. Before you remove the wire screens open the cellar door wide at night, allowing the cellar to become cool. This will force the bees back in the hives; then quietly remove the screens. If you will give the bees infusions of fresh air constantly, from some sort of ventilator, they will become more quiet. The best thing you can do now, probably, is to open the cellar-door at night and close it by day; but do not open the cellar if the bees are quiet. During severely cold weather it will probably not be necessary to open the cellar.

If you provide ventilation we think you will find that your troubles will disappear. When bees are shut in with wire cloth it is apt to make them very uneasy. In their efforts to escape they stir up the whole colony. Under such conditions the only thing to do is to reduce the temperature of the cellar nearly to freezing, and then quietly remove the screens as before explained.—ED.]

### Grafting and Cell-building; Staple-spaced v. Metal-spaced Hoffman Frames.

I am anxious to raise queens for my own use, and did so the past season, requiring 75 colonies, some of which were black stock, all with pure Italians of Jones' stock. This, of course, was accomplished by removing the queens and causing the bees to build cells which were weeded out when near hatching, leaving the best one for the hive, provided it were Italian. The blacks had all cells removed; and when they realized their plight a nice plump Italian cell was grafted to the comb, and may be they did not look after it, regardless of the fact that their color was to go on for ever. I am desirous of rearing queens next season in nuclei by the use of queen-cups so as to have the queens mated and laying before introducing to the colonies made queenless; and any information as to the grafting of eggs or larvae into these cups would be gladly received. I presume one strong colony will nourish the whole set of cells up to within a few days of hatching, when they have to be separated and given to each nucleus.

Do the good qualities of the staple-spaced frames overcome the bad ones—that is, in the way of swinging in the hive, etc.?

H. HARLEY SELWYN.

Director of Experimental Farms, Ottawa, Can.

[For information on grafting cells you are referred to our A B C and X Y Z of Bee Culture under the head of "Queen-rearing." One strong colony will furnish you all the cells you require if you do not expect more than 10 or 12 cells for every 10 days. While it is possible to get as many as 55 or 60 cells from a single colony during that same period, you will get stronger and more vigorous stock by giving the bees only about a dozen cups to feed and take care of. In your case, at least, we would advise you to make the colony queenless, and then feed a little every day if no honey is coming in, say from a half to a full pint of syrup. You can not get good results unless the colony is put in a highly prosperous condition. Until you have had more experience we would not advise you to adopt the twin or baby nuclei. Better use nothing smaller than the two-frame Langstroth nucleus. After you have had a little more experience you can get down to the smaller boxes.

The staple-spaced frames are not nearly so satisfactory as the Hoffman metal-spaced frames. The staples space only the top-bars and not the end-bars, while the Hoffman metal spacers hold the frames square and true.—ED.]

### Feeding During the Winter in Tennessee.

Having purchased several stands of bees this winter at \$1.50 per hive, in log and board hives, without any frames or boxes inside, I desire to know how I shall feed; or, will they need feeding? The combs are built on the same principle they are in the bee-tree. Ha! ha! what comb I can see by removing the cover seems empty! I intend to transfer to Danzenbaker hives in the spring.

Would you think that old burlap bags wrapped around these box hives would be ample protection in this latitude? Our bees fly every month in the year; but many of the nights are very cold.

At what date would you advise feeding for stimulating or for increase in the spring. Fruit-blossoms open in March.

Maryville, Tenn., Nov. 28.

C. R. COULTER.

[If your weather gets warm enough for you to make an examination it would be well to remove enough of the cover or side, as the case may be, of one of the hives and ascertain the condition of that colony so far as stores are concerned. If you do not find that there are 20 to 25 lbs. of honey, you had better do some feeding. It is a question whether you can feed sugar syrup; but as your bees can fly every day we should think that you can. It is well to feed toward evening, so that the excitement caused by the syrup may subside before morning, so that other bees may not be unduly stirred up and robbing started. After you have examined one colony, if the others are about the same size and the hives about the same, you can probably get a pretty good idea of the condition by lifting or weighing the hives, noting any that may seem unduly light.]

Without knowing more in particular in regard to how cold it gets, etc., we can not be sure how much protection these hives need; but we presume that burlap sacks wrapped around and covered with some waterproof material in the shape of a cover would be sufficient. Do not put on any packing that can get soaked with water and then frozen, for such packing is only a detriment. Whatever packing you use, keep it dry.

Most progressive bee-keepers of to-day say it is much better to provide the necessary amount of stores in the fall, and do no feeding for stimulating in the spring. However, exceptions must be made in case of colonies that, for some reason or other, have not the necessary amount of stores. Colonies which are well supplied, ordinarily do not need feeding in the spring.—ED.]

### Carbolic Acid for Driving Bees Out of Supers.

Will you be kind enough to give me some information about the use of a carbolic solution for quieting bees?

Lordsburg, Cal., Dec. 1.

JOHN STRIPSKY.

[Carbolic acid in a diluted solution for quieting bees has been used to only a very limited extent. Our British cousins sometimes use a piece of muslin saturated in a weak solution of carbolic acid, laid on top of a super of sections. It is said that the odor of the acid is so repugnant to the bees that in a very short time they will all go down into the brood-nest below. How true this may be, we do not know from personal experience; but the fact that we do not hear very much of these carbolic cloths for the purpose mentioned would rather lead us to believe that the scheme works prettier in theory than it does in actual practice. If anybody knows to the contrary we should be pleased to have him report.—ED.]

### Feeding to Prepare for a January Honey-flow.

About the 10th of January we have a flow of nectar lasting about two weeks. Queens quit laying in October, and by January the colonies are very small. Bees fly nearly every day in the year at my place, and there has never been a week when I have not seen a few bees bringing in pollen. Would you advise feeding when the colonies can say, "Millions of honey at our house"? With strong colonies I think more honey would be stored here in January than in any other month.

Bakersfield, Cal., Nov. 24.

C. G. KNOWLES.

[Under the circumstances we would advise you to practice a little stimulative feeding along about the middle of November or first of December, and continue it up to within a week of the honey-flow. Enough feed should be given so that the bees will have the brood-nest filled with brood and sealed

honey. We say *sealed*, so that they will not carry any of the fed syrup up into the supers. For that reason we advise discontinuing stimulative feeding just about a week before the honey-flow actually begins.—ED.]

### How to Make a Weak Colony Robber-proof.

Mr. G. H. Latham, p. 737, Nov. 15, take that rather weak colony from its stand early in the morning; put it in a safe place when its bees can go out at will. Put a baited robber-trap in its place with a screen cover and a tight cover on top. Leave it there until you have trapped all the bees needed, which will include many of the field bees from the weak colony. Take your catch into the part of a room furthest from the window; remove the cover; set it on end with the screen facing the light (which should be rather limited). Let it remain all day or until the bees realize they are hopelessly caged; then give them time to repent. Unite the weak colony with the catch. After 12 hours they may be placed anywhere in the yard, and you will have a colony as nearly robber-proof as any. This not only abates a nuisance but turns the nuisance to good account.

Sonora, Cal.

A. D. HEROLD.

### Why the Honey was Not All Capped Over,

I should like to know why my comb honey contained so many cells partially and entirely filled that were not capped. In other words, why was not the comb filled out to the edge of the section? A great many colonies had sections partially built that were never finished.

East St. Louis, Ill. C. O. ~~REED~~ J. C. READER.

[It looks to us as if you had an extraordinarily good flow of honey that ceased suddenly. This nearly always results in a lot of uncapped honey and unfinished sections. It may be that you put on supers a little too rapidly, and did not give the bees time to finish what they had. Of course, it is a regular practice to add new supers before the first ones are entirely finished; but in case the honey-flow is nearly at an end, a new super put on will result in only a lot of unfinished combs. For this reason the putting-on of more supers must be done with extreme caution.—ED.]

### A Steady Temperature of 33 F., in the Cellar; the Probable Effect on the Bees.

Having my cellar full of bees I was compelled to put 47 colonies in a neighbor's stone cellar, size 20x10x7. The thermometer registered steady 33 above with no way of raising it except artificially. How are these bees likely to come out after perhaps four months of confinement? I am a little worried about them.

Fawndale, Minn., Dec. 8.

JOHN S. LIND.

[A steady temperature of one degree above freezing is altogether too cold for a bee-cellar. You will probably find that, before spring, many of the colonies will be dead outright, and others much weakened down, and suffering from dysentery. You ought to arrange to put in artificial heat to bring the temperature up to 45; and you probably would require, also, some ventilation, although a cellar 20x10x7, for only 47 colonies, ought, with proper temperature, to take care of that number with very little ventilation. Probably opening and closing the cellar-door at night at intervals would be sufficient.—ED.]

### How Much Honey should a Purchaser Expect to Receive in a 60-Pound Can?

I bought 120 lbs. of honey, and when it arrived it was weighed; and with the cans which contained it it weighed exactly 120 lbs. Now, I wish to know if the purchaser of honey should pay for 114 lbs. of honey and 6 lbs. of tin, or should he receive 120 lbs. of honey net? An answer through GLEANINGS would probably be of interest to other bee-keepers who buy honey to help out their shortage.

Pawtucket, R. I., Nov. 21.

F. E. CURRAN.

A good deal will depend on how the honey is bought and sold. If it is bought by the *can* the seller may put in less than 60 lbs. to the can. It is our rule in selling honey to put in full 60 lbs. in each can.—ED.]



## Our Homes

By A. I. Root

Surely goodness and mercy shall follow me all the days of my life, and I will dwell in the house of the Lord for ever.—PSALM 23:6.

To-day, Dec. 9, is my birthday, and I am really 71 years old; and, may the Lord be praised, I am strong and well, physically, mentally, and (I trust and pray) *spiritually* also.

In a little Sunday-school paper called *Forward*, that is distributed at our church to all the classes, old and young, I found the following little gem of thought:

Only things to eat and drink and wear are high in price. Happiness is at the same old figure.

I read it over and laughed, and read it over again, and thanked God that it *is* indeed true. We may, if we will, or if we choose, all of us, have "happiness" at the "same old figure." My life has, as a rule, been a happy one. I was happy in childhood, and I am happy (may God be praised again) in my old age. One especial thing that has made my life a happy one is that I was always keenly interested in exploring the wonders of God's creation. Even in early childhood I was full of curiosity in regard to every thing about me; and when father or mother could answer my eager questioning no further, I set about making the plants and animals tell what *they* knew. In other words, I put them on the witness-stand, as we are told Prof. Holden put corn "on the witness-stand," and made corn answer his questions. Bees were my first great hobby, and for many long years I questioned them indefatigably, both day and night. Of course, the explorer in nature's domains meets with many disappointments, and, as a rule, follows many false scents, oftentimes, before he gets on the true trail; but, oh the joy and thrill that one feels when he gets at the truth and reaps his reward!

To illustrate the above, and to tell you at the same time how I am enjoying my "old-age vacation," as I sometimes term it, I will tell you something about what I am now engaged in.

I have told you before about my arrangement for watering my seven yards of chickens, with dropping water, in an overflowing dish in each yard; well, the plan I have been using requires quite a little pumping every morning, and it was, therefore, quite desirable to have a running stream; so we sank a well on the highest part of our premises, and found plenty of water down about four feet. As our ground slopes strongly, in only a few rods this water would be on top of the ground; so we got some cheap second-hand pipe and undertook to siphon the water out of the well; but although the long arm of the siphon was several inches lower than the water in the well, it didn't work.

The reason was, a much stronger fall is needed to pull water out of a well, under such circumstances; and the friction in passing through a long iron pipe of small diameter (more or less rusty inside, besides) was more than I had calculated. We spent considerable time on it before we reluctantly gave it up, and now I must confess to a piece of stupidity on my part that I am ashamed of; but as it well illustrates my point, I will tell you about it.

During these very experiments mentioned, we were having trouble with water coming up through the cement floor of our incubator cellar. My brother had suggested digging a ditch in which to place the pipe from the well to the poultry-yards; but this would be quite an expense, besides littering up the premises; and we should also have to cut through quite a few clumps of palmetto. In trying to drain the cellar I first put in a two-inch cement tile; but the palmetto roots or something else soon rotted the tiles. Perhaps they were made of cement not "rich" enough; at any rate, they soon failed. I then dug them all up and put in four-inch sewer-pipe; but after the heavy rains of last summer, even this sewer-pipe became filled up more or less with the soft white quicksand that runs almost like water in this region. The consequence was, that when I got here the first of November there was several inches of water in the cellar; and the "legs" (and especially the "ankles") of my Cyphers incubator indicated the water had been almost a foot deep and had stood there for some time.

By the way, when I commenced making a cellar here in Florida I was told by several that you couldn't *have* cellars here; and I was just beginning to find out at least one reason why. Now, a damp or wet cement floor for an incubator cellar is just what is wanted; but, of course, we do not want water a foot deep. After pondering over the matter I declared I would put in an iron pipe, so fixed that sand could *not* get into it. And this is the way I did it: We cut out a small circle in the floor of the cellar, and with a post-auger made a small well about three feet deep. The iron pipe was then turned to go down into this well, nearly to the bottom. This pipe was then laid under the floor (and, of course, under water), and then pushed down through the filled-up sewer-pipe, so we had no digging whatever to do. Thus you see we had a "living spring" of pure soft water, and had the cellar drained nicely, and about then it occurred to me that if this pipe was connected with my "water works," we had not only killed two birds with one stone, but three, and the last one a "whooper." We not only have running water in all our yards, but have an overflowing tub full for four Indian Runner ducks that we brought from Ohio.

There are several lessons to be learned from the above: First, that we can not well appreciate something of value to us until we have labored and experienced disappoint-

ment in getting it. Secondly, the things that annoy us most, and seem at times almost insurmountable, may finally turn out to be one of our greatest blessings.

Once more: When we first started "our cottage in the woods" Mr. Rood suggested that, on account of a chance fire, it would be an excellent idea to clear a path or lane clear round our premises, and so we have had Wesley, whenever he had spare time, clear up a lane ten feet wide, and we have lately had this lane fenced off and planted with oats and other crops for the chickens. You see this arrangement makes it very convenient to throw the droppings from any poultry-house right over the fence into the lane; and whenever it is desirable to admit the fowls from any yard into this lane it is easily done by raising the fence a little. A hen with chickens can be given much or little room in this lane by putting in a cross-fence. At present we are growing some of the upland rice I have spoken of at one end of the lane down by the creek, where the ground has always been pretty damp and wet for any thing else. Our chufas that I have spoken of have also been grown in this lane, and we also grow carrots, collards, and any thing else we find the chickens are fond of. We sow oats broadcast, a little patch every few days, and in this way we always have oats of the right size to pull up by the roots for the chickens. Now the planning for all this work gives me exercise for the mind; and taking hold of the tools occasionally gives me exercise for the body. Last Wednesday evening at the close of the prayer-meeting our pastor made a remark something like this: He said the church of God needed not only consecration and sanctification, but it needed also "perspiration." Well, I am strongly impressed with the idea that this thing we call *happiness* can not be found, at least in its highest and purest attainment, without this same "perspiration," and, I might almost add, with both mind and body.

Our new automobile has not arrived yet, although it was shipped from Chicago almost two months ago, and, as a consequence, we have been obliged to have more or less repairs on the old one; and after having tried one after another of the three repair-shops here, Wesley and I have been obliged, on account of the expense, to do most of our own repairing. Well, you would not at first glance conclude that crawling under a car, getting your hands and possibly your clothing covered with black grease, was particularly *conducive* to happiness; but I want to tell you, you are mistaken. Some of my happiest moments have come when, after perplexing and fatiguing toil, we have succeeded in correcting something the expensive experts up town failed to master. In like manner I find happiness in surmounting *other* difficulties. Because of a door that shut imperfectly, a possum got in to a sitting hen and ate every egg except one, when almost ready to hatch. Well, I fixed the door; then, after two attempts,

caught the possum in a steel trap; and my next sitting hen gave us 14 smart chicks from 14 fertile eggs, and the whole 14 are now two weeks old, and as smart as crickets.

There are many inquiries about the Buttercups. Well, although they (the three hens) did some tall laying last spring and summer, after moulting they were very slow in getting started to laying again, and only one was laying the first of December, and she lays only every other day. She lays a very long white egg, extra large; in fact, it is unlike any egg you ever saw, for it is more like a rolling-pin than like an ordinary egg. If she will only keep it up the year round I may have some faith in Buttercups after all. When I first came back, the Buttercup roosters had grown so much and improved so much, even after they were a year old, that I said the first evening that the best one was worth \$5.00. The next day the beauty of his plumage, his kingly carriage, with his royal streamers and gaudy coloring, impressed me so much that I raised the price to \$10.00; but when I kept on adding \$5.00 each day to his value until I got up to \$25.00, Mrs. Root called a halt, reminding me that I knew nothing at all about "scoring" fancy birds. Well, he *is* about the handsomest bird I ever saw, any way.

And this reminds me that quite a few have written, asking if I would sell some Buttercups or eggs. Now, good friends, I hope none of you will feel hurt if I tell you I could not, with a clear conscience, sell any thing that I have mentioned here in these Home papers. God has, in his infinite mercy, placed me here to give you all unbiased facts about Florida, Buttercup chickens, and a host of other things. What would you think of me were I to use this great privilege to boom something I had for sale? What would you think of a minister who would mention in his sermon the things he had for sale during the week? It is true the editor of a family journal does not occupy *exactly* the sacred position of the minister; but I think he *ought* to realize that he should feel pretty near that responsibility resting on him. Think of the number of men who have been placed by the people in important places, solely to protect their interests, but who have used their great privilege and opportunity to steal from the people and our nation. May God forbid that this thing should go on any longer. If I should use these pages accorded me for years by those who pay for this journal to boom the stuff The A. I. Root Co. have for sale, do you think I could feel happy in repeating over and over the precious text I started out with — "Surely goodness and mercy shall follow me all the days of my life, and I will dwell in the house of the Lord for ever"?

---

From one colony, spring count. I increased to five by natural swarming, and secured 120 lbs. of comb honey. Two swarms absconded, so the increase would have been seven if I had succeeded in keeping them all.

Homert's Ferry, Pa., Dec. 12.

EMMA V. BILES.